

Five-Year Review Report

Second Five-Year Review Report for Synertek Superfund Site Santa Clara, CA

September 2002

Approved by:

Date:



**John Kemmerer, Chief
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9/30/02

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION**

Toxics Cleanup Division

Five-Year Review Summary

**Synertek Building 1
3050 Coronado Drive
Santa Clara, California**

I. INTRODUCTION

Authority Statement. Purpose. The California Regional Water Quality Control Board, San Francisco Bay Region, conducted this review pursuant to the Multi-Site Cooperative Agreement (MSCA) between the U.S. EPA Region IX and the Regional Board. It is a policy review. The purpose of a five-year review is to ensure that a remedial action remains protective of public health and the environment and is functioning as designed. On behalf of Honeywell International, Inc., the Principle Responsible Party for the Synertek Building No. 1 Site, CH2MHILL has prepared the Second Five-Year Review for the Synertek Building No. 1 Site. The report was prepared in accordance with the U.S. EPA Comprehensive Five-year Review Guidance published in June 2001. This report summarizes the Five-Year Review and provides the Regional Board's comments and rationale and explains any differences with the conclusions of the Five-Year Review report. This document, along with the Five Year Review Report will become a part of the Site File (No. 2189.8135).

Site Characteristics:

Location. The Synertek No. 1 Facility is located on Coronado Drive about a block from where it intersects Central Expressway in the City of Santa Clara. The predominant groundwater flow direction is towards the northeast. The underlying sediments are a heterogeneous alluvial material consisting of sands and gravels interbedded with silts and clays. Three aquifer zones have been identified and are designated the A-zone, B-zone and B1-zone. Groundwater is first encountered at approximately 10 feet below the surface in sand and silty sand deposits which make up the A-zone aquifer. The B-zone aquifer is generally encountered from 30 to 50 feet below the surface and is separated from the A-zone aquifer by a 10 foot thick sandy and silty clay aquitard. The B1-zone aquifer was encountered between 100 and 108 feet below the surface and is separated from the B-zone aquifer by an approximately 60 foot thick clay aquitard. Groundwater in the A-zone flows to the north and B-zone groundwater flows to the northeast. A deep regional aquifer which supplies drinking water for the Santa Clara Valley underlies the site and is separated from the B1 aquifer by a 63 foot thick clay aquitard. VOC pollution from Synertek has impacted the A-zone and B-zone

aquifers. VOCs have not been detected in the B1-zone.

Source of Contamination. The Synertek No. 1 Facility was used for semiconductor manufacturing from 1974 until 1985. The facility had a 200 gallon underground storage tank, used for storing solvents, and three neutralization tanks. The solvents stored in the tank were primarily TCE and TCA. Leakage from the underground tank and neutralization tanks is responsible for groundwater pollution at the site.

Maximum Contamination. The historical maximum VOC concentrations in the A zone were TCE - 490 ug/l, 1,1,1-TCA - 810 ug/l, 1,1-DCE - 84 ug/l, 1,1-DCA - 8.2 ug/l, 1,2 DCA - 16ug/l, Freon 113 - 1300 ug/l. Currently, only TCE is above the cleanup level. Concentrations of VOCs in the B zone are higher. Historically, TCE has been found at up to 33,000 ug/l and 1,1,1-TCA has been found at up to 22,00 ug/l in the B zone.

II. DISCUSSION OF REMEDIAL OBJECTIVES

Remedial Actions:

Groundwater. Investigation and remediation efforts at the site have been ongoing since 1983. The solvent tank and neutralization tanks were removed in 1985. Groundwater extraction and treatment began in 1987 with pumping from two A-zone extraction wells and one B-zone extraction well. Currently, there are four A-zone and two B-zone extraction wells. There are 25 A-zone and eight B-zone groundwater monitoring wells at the site.

In 1990 the discharger performed a Remedial Investigation/Baseline Public Health Evaluation (RI/BPHE) and a feasibility study. The feasibility study evaluated different remedial action alternatives. A complete description of the alternatives is contained in the November 1990 FS report. The Regional Board adopted Site Cleanup Requirements (SCRs), Order No. 91-051, for the site in March 1991. The alternative that was selected in the SCRs as the final cleanup plan consisted of: 1) a deed restriction prohibiting the use of shallow groundwater, 2) groundwater monitoring, 3) groundwater pumping from the A-zone and the B-zone, 4) treatment of extracted groundwater with air stripping and discharge of the treated groundwater to the storm drain under an NPDES permit. The U.S. EPA signed the Record of Decision (ROD) for the Synertek Building 1 Site on June 28, 1991.

The deed restriction has been finalized and recorded. Groundwater was extracted and treated until February 2001 at which time the Regional Board approved the shut down of the groundwater extraction system and authorized a monitored natural attenuation trial period.

The SCRs set cleanup standards at California proposed or adopted Maximum Contaminant Levels (MCLs), EPA MCLs, California Action Levels, or a level based on a risk assessment. These cleanup

levels are:

Chemical	Final Cleanup Standard (ug/l)
acetone	1,200
benzene	1
2-ethylhexyl	4
cis-1,2-DCE	6
ethylbenzene	680
styrene	5
toluene	100
xylene	175
TCE	5
TCA	200
DCA	5
DCE	6
TDCE	not established
freon 113	1,200
vinyl chloride	0.5

Section IV of the discharger's report states that a goal of the remedial action at the site is, "groundwater extraction shall continue as long as it removes significant quantities of chemicals". This is not a goal specified in the Final Site Cleanup Requirements or the EPA ROD. The remedy called for extraction of groundwater until cleanup standards are met. Experience gained over the last 10 years at numerous sites in California and elsewhere, since the Final Site Cleanup Requirements were adopted, has shown that groundwater extraction may not be able to achieve low MCL cleanup standards. At many sites significant amounts of VOC mass can be removed, however MCLs may not be achievable through groundwater extraction alone. The Regional Board may allow a site to shut down a groundwater extraction system when the efficiency of VOC removal through groundwater extraction has declined to the point that significant VOC mass is no longer being removed.

Soils. Soils beneath and adjacent to the solvent tank and neutralization tanks which were impacted with VOCs were removed.

Sampling results indicated that soils containing VOCs in excess of 1 part per million (ppm) were removed.

III. ARARs REVIEW

Applicable relevant and appropriate standards (ARARs) for the compounds for which final cleanup standards were adopted were reviewed. These ARARs are drinking water standards for 11 of the 14 compounds. Five of the ARARs have changed since the SCRs were adopted. These changes were identified in the previous Five-Year Review. No additional changes were found for this Five-Year Review. The following summarizes these changes:

Acetone:	From 1,200 ug/l to 610 ug/l
bis(2-ethylhexyl)phthalate:	From 4 ug/l to 4.8 ug/l
ethylbenzene:	From 680 ug/l to 700 ug/l
Styrene:	From 5 ug/l to 100 ug/l
Toluene:	From 100 ug/l to 150 ug/l

Currently the cleanup is being driven by TCE, DCE and DCA, for which ARARs remain the same. Hence, the change in ARARs for the above five compounds should not effect the cleanup.

IV. EFFECTIVENESS EVALUATION

Discharger's Evaluation. The 5-year status report is the discharger's evaluation of the selected final cleanup remedy and cleanup costs. This report also contains an evaluation by the discharger, if drinking water standards have not been achieved, addressing whether it is technically feasible to achieve drinking water quality on-site.

Effectiveness of Site Remediation. Soil contaminated with greater than 1 ppm of VOCs has been excavated and removed. There is currently believed to be no source contributing additional VOC mass to the groundwater. The first Five-Year Review concluded that the mass removal rate of the groundwater extraction system has declined somewhat but was still relatively constant, indicating that the system remains effective at removing VOCs from groundwater. The discharger predicted that the system will remain effective for a few more years but that VOC levels will begin to reach asymptotic levels and removal of VOCs will no longer result in significantly reducing VOC concentrations in groundwater. It was concluded that the cleanup plan has worked in that groundwater extraction has reduced the VOC concentrations in groundwater at the site and has prevented further migration of the plume. However, it is possible that due to the limitations of groundwater extraction, cleanup standards may not be achieved.

In February 2001 the Regional Board approved a trial period of

Monitored Natural Attenuation (MNA) for the site. As predicted in the first five-year review, the efficiency of VOC removal through groundwater extraction had declined to the point where only a relatively small amount of VOC mass was being removed. The Regional Board approved a one year trial period which was to be extended if groundwater monitoring results indicated the VOC plume was remaining stable and not expanding. MNA was also to be evaluated to see if reduction in VOC concentrations were taking place with no groundwater extraction.

Groundwater Monitoring Review

The Five-Year Review evaluated groundwater monitoring data collected from 1996 to 2001. The following conclusions drawn from the review of monitoring data are contained in the Five-Year Review:

The extent of contamination has not increased in either the A zone or the B zone. The B1 zone remains free of VOCs. Operation of the groundwater extraction system has been effective in significantly reducing contaminant concentrations in both the A and B zones. Overall, the groundwater extraction and treatment system (GETS) is protective of human health and the environment, has reduced the volume and mobility of the VOCs, and has been effective over the 14 years of operation. However, since 1998, data indicate contaminant levels have not continued to be further reduced, and the GETS performance appears to be reaching asymptotic levels. Therefore, continued operation of the GETS is not expected to further reduce contaminant concentrations to a significant degree.

An MNA approach may be a viable long term strategy for the site. Future MNA data trends are required to fully assess MNA as a long-term strategy.

The Regional Board generally concurs with this assessment, however the Board does have some concern about VOC levels in monitoring well 4B. VOC levels in this well increased from 181 ug/l to 883 ug/l following shutdown of the GETS. This well is screened in the B zone below the contaminant source area. Concentrations of VOCs were initially very high in this well. TCE was found at up to 33,000 ug/l and 1,1,1-TCA was found at up to 22,000 ug/l. It is possible that additional VOC mass may remain in this area at levels sufficient to result in a continuing increase in VOC levels in well 4B. If concentrations continue to increase in well 4B or if the VOCs appear to be migrating, it may be necessary to turn on one or more of the B zone extraction wells.

The Regional Board concurs that MNA may be a viable strategy for the site. MNA data trends will be reviewed over the next year to determine whether MNA is appropriate for the site. It may be that

MNA is suitable for the A zone, but continued groundwater extraction or some other remedial strategy may be required for the B zone.

V. SUMMARY OF SITE VISIT

The most recent site visit occurred on August 1, 2002 when a compliance inspection was conducted by a member of the Board's Staff. The inspection did not reveal any violations, and the site was found to be in full compliance.

VI. AREAS OF NONCOMPLIANCE

The discharger has fully implemented the approved remedial action plan, consistent with the remedial objectives, and is in compliance with all current Board Orders as modified by the approval of an MNA trial period.

VII. TECHNICAL ASSESSMENT

Answers to Questions A, B, and C

Question A - Is the remedy functioning as intended by the decision documents?

Concur. The GETS system has operated for 14 years. The Regional Board approved the shutdown of the GETS for a trial period of MNA. Evaluation of MNA is continuing.

Question B - Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?

Concur with exceptions. No changes in exposure pathways, toxicity, or other contaminant characteristics have occurred. The previous Five Year Review identified five ARARs contained in the final site cleanup requirements that had changed. These are:

Acetone:	From 1,200 ug/l to 610 ug/l
bis(2-ethylhexyl)phthalate:	From 4 ug/l to 4.8 ug/l
ethylbenzene:	From 680 ug/l to 700 ug/l
Styrene:	From 5 ug/l to 100 ug/l
Toluene:	From 100 ug/l to 150 ug/l

Currently the cleanup is being driven by TCE, DCE and DCA, for which ARARs remain the same. Hence, the change in ARARs for the above five compounds should not effect the cleanup.

The exposure assumptions used to develop the Human Health Risk Assessment were for potential future exposure if untreated groundwater were to be used for drinking water and if residential

uses were to occur on the site. There have been no changes to the toxicity factors for the contaminants of concern that were used in the baseline risk assessment. These assumptions are considered to be conservative in evaluating risk and developing risk-based cleanup levels. Institutional controls prohibit the use of groundwater and groundwater is not currently used at the site. The land use of the site is commercial/industrial. No changes to the assumptions, or the cleanup levels developed from them is warranted. There has been no change to the standardized risk assessment methodology that could effect the protectiveness of the remedy. The Regional Board has developed risk-based screening levels for a variety of exposure routes including vapor intrusion into buildings from underlying groundwater contamination. The current levels of VOCs in groundwater at the site are below the screening levels for potential indoor air risk for a commercial/industrial use scenario.

Question C - Has any other information come to light that could call into question the protectiveness of the remedy?

Concur.

VIII. RECOMMENDATIONS AND FOLLOWUP ACTIONS

The report states that the GETS appears to be reaching asymptotic levels and the system is no longer an effective remedy for the site, and therefore it is recommended that operation of the GETS be discontinued.

The Regional Board concurs that the efficiency of the groundwater extraction system has declined considerably. However, it does provide effective hydraulic control of the VOC plume. If the VOC plume begins to expand under MNA, groundwater extraction may need to resume.

The report recommends that the MNA program be continued. The Regional Board concurs that the results of the MNA study indicate that the plume is stabilizing and not increasing in size in the A zone. The plume has not increased in size in the B zone since the GETS was turned off, however, source area well 4B has shown a significant increase in VOC concentrations. If VOC levels continue to increase in this well, B zone groundwater extraction or another remedial approach may be necessary.

With the above caveats, the Regional Board concurs that the MNA program of 2001 through the present be continued.

IX. PROTECTIVENESS STATEMENT

Concur. Because the remedial actions at the site are protective, the site is protective of human health and the environment. It

is expected that it may require ten years or more to achieve cleanup goals. In the interim, ingestion of contaminated groundwater and residential use are the only exposure pathways that could result in unacceptable risks. The groundwater ingestion pathway is being controlled through institutional controls prohibiting the use of groundwater. The site and the surrounding area are zoned commercial/industrial and are in the middle of the Silicon Valley computer related research, development, and manufacturing area. Residential use of the site is prohibited for the foreseeable future.

The risk assessment performed for the site in the BPHE identified inhalation of vapors from underlying groundwater in a residential use scenario as a potential exposure pathway that could result in unacceptable risk. The risk assessment did not evaluate this exposure pathway for commercial/industrial use. The Regional Board has developed risk-based screening levels for a variety of exposure routes including vapor intrusion into buildings from underlying groundwater contamination. The current levels of VOCs in groundwater at the site are below the screening levels for potential indoor air risk for a commercial/industrial use scenario.

The existing monitoring well network and sampling program is sufficient to track the stability of the plume and to evaluate the effectiveness of MNA in remediating the groundwater contamination.

X. NEXT FIVE-YEAR REVIEW

The next 5-year review will be conducted by September 2007.

Second Five-Year Review Report

Prepared for

**Honeywell Synertek Building No. 1
3050 Coronado Drive
Town of Santa Clara
Santa Clara County, California**

Prepared by



CH2MHILL

April 17, 2002

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- 8 Total Target VOCs, A Aquifer (1999)
- 9 Total Target VOCs, B Aquifer (1999)
- 10 Total Target VOCs, A Aquifer (2000)
- 11 Total Target VOCs, B Aquifer (2000)
- 12 Total Target VOCs, A Aquifer (2001)
- 13 Total Target VOCs, B Aquifer (2001)
- 14 Upgradient Well 1A
- 15 Within Plume
- 16 Downgradient (Near)
- 17 Downgradient (Far)
- 18 Aquifer B - Well 4B
- 19 Aquifer B - Well 12B

List of Acronyms and Abbreviations

ARAR	Applicable or Relevant and Appropriate Requirement
µg/ L	micrograms per liter
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CO	Consent Order
COCs	chemicals of concern
CRWQCB	California Regional Water Quality Control Board
FCS	Final Cleanup Standard
FS	Feasibility Study
FS / RAP	Feasibility Study/Remedial Action Plan
GETS	groundwater extraction treatment system
IRM	Interim Remedial Measure
MCL	Maximum Contaminant Level
MNA	Monitored Natural Attenuation
NPDES	National Pollution Discharge Elimination System
NPL	National Priorities List
O&M	operation and maintenance
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objective
RI	Remedial Investigation
RI / BPHE	Remedial Investigation/Baseline Public Health Evaluation
SCR	Site Cleanup Requirements
Site	Honeywell Synertek Building No. 1 Site
TCA	trichloroethane
TCE	trichloroethylene
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compounds

Executive Summary

The second five-year review of the Honeywell Synertek Building No. 1 site (Site), located at 3050 Coronado Drive in Santa Clara, California, was completed in March 2002. The results of this second five-year review indicate that the remedy is expected to be protective of human health and the environment. Overall, the remedial actions that have been performed are functioning as designed, and the Site has been appropriately maintained.

Two issues were noted that do not directly impact the protectiveness of the remedy. These issues and their associated recommendations are:

- Performance of the groundwater extraction treatment system (GETS) appears to be reaching asymptotic levels and the system operations are no longer cost effective. Therefore, it is recommended that operation of the GETS be discontinued.
- Results from the monitored natural attenuation (MNA) study indicate the plume is stabilizing and not increasing in size. Since there is no imminent threat to human health and the environment, it is recommended that long-term natural attenuation monitoring be continued. If the plume does not remain stabilized after sufficient data trends are collected, then other options will be evaluated.

Five-Year Review Summary Form

SITE IDENTIFICATION					
Site Name (from WasteLAN):		Honeywell Synertek Building No. 1			
EPA ID (from WasteLAN):		CAD990832735			
Region: EPA Region		State: CA	City/County: Santa Clara/Santa Clara		
SITE STATUS					
NPL Status: Final					
Remediation Status (choose all that apply): Complete					
Multiple OUs?: NO			Construction Completion Date: June 1987		
Has site been put into reuse? YES NO					
REVIEW STATUS					
Reviewing Agency:		California Regional Water Quality Control Board			
Author:	Mike Wray				
Author Title:	Project Manager		Author Affiliation:	CH2M HILL, Inc.	
Review Period:	1996 to 2001				
Date(s) of Site Inspection: Weekly during GETS operation; quarterly during MNA					
Type of Review:		Post-SARA	Pre-SARA	NPL-Removal Only	
(type is bolded)		Non-NPL Remedial Action Site		NPL State/Tribe-lead	
		Regional Discretion	Statutory		
Review Number:	1 (first)	2 (second)	3 (third)	Other (specify)	
(number is bolded)					
Triggering Action:					
Actual RA Onsite Construction at OU# _____			Actual RA Start at OU# _____		
Construction Completion			Previous Five-Year Review Report X		
Other (specify)					
Triggering Action Date (from WasteLAN): 1996 First Five-Year Review					
Due Date (five years after triggering action date): April 2002					

Notes:

"OU" refers to operable unit.

Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.

Five-Year Review Summary Form (Continued)

Issues:

Two issues have been noted during the second five-year review:

- The GETS is no longer effectively removing VOCs.
- Due to the short duration of the MNA program, it is uncertain whether natural attenuation processes will effectively achieve plume stabilization and reduction.

Recommendations and Followup Actions:

- Performance of the GETS appears to be reaching asymptotic levels and the system is no longer an effective remedy for the Site. Therefore, it is recommended that operation of the GETS be discontinued.
- Results from the MNA study indicate the plume is stabilizing and not increasing in size. Since there is no imminent threat to human health and the environment, it is recommended that a MNA program be continued. If the plume does not remain stabilized and begins to increase in size, pilot studies for in situ bioremediation or other appropriate technologies will be evaluated.

Protectiveness Statement(s):

The current remedy of monitored natural attenuation at the Site protects human health and the environment. In general, contaminant levels in Site groundwater have decreased over time and either natural or enhanced natural attenuation processes are expected to further reduce contaminant levels on the Site. The groundwater remedy is expected to be protective of human health and environment upon completion, and immediate threats have been addressed.

Other Comments:

None.

I. Introduction

On behalf of Honeywell International, Inc. (Honeywell), CH2M HILL has prepared this *Second Five-Year Review Report* for Honeywell Synertek Building No. 1 site located at 3050 Coronado Drive in Santa Clara, California (Figure 1). The review was conducted in March 2002, and this report documents the results of the review.

The purpose of the second five-year review is to determine whether the remedy implemented at a Site is protective of human health and the environment. This report was prepared according to California Regional Water Quality Control Board (CRWQCB) Site Cleanup Requirements (SCR) No. 91-051, and includes:

- Site chronology of events relative to the SCR
- Background of the Site
- Summary of remedial actions at the Site to date
- Progress made at the Site since the last five-year review
- Recommendations and followup actions

This is the second five-year review for the Honeywell Synertek Building No. 1 site. The triggering action for this review is the date of the first five-year review, which was completed in January 1996. This review is required because contaminants remain onsite above levels that allow for unlimited use and unrestricted exposure.

II. Site Chronology

Table 1 below summarizes events at the Site from 1996 through 2001.

TABLE 1

Continuing Chronology of Site Events
Honeywell Synertek Building No. 1, Santa Clara, California

Event	Date
Second Five-Year Review Period	1996-2001
Quarterly Groundwater Monitoring	February, May, August, and November 1996
Fourth Quarter 1996 Progress Report and Evaluation of Site Cleanup Measures	January 1997
Semi-Annual Groundwater Monitoring	January and July 1997
Semi-Annual Groundwater Monitoring	January and July 1998
Report of Monitoring and Sampling, July through December, and Evaluation of Cleanup Measures	January 1999
NPDES Permit Renewal Package Submitted	January 13, 1999
Semi-Annual Groundwater Monitoring	February and July 1999
Semi-Annual Groundwater Monitoring	January and August 2000
Report of Monitoring and Sampling, July through December 1999	February 2000

TABLE 1

Continuing Chronology of Site Events
Honeywell Synertek Building No. 1, Santa Clara, California

Event	Date
Proposed Monitoring Natural Attenuation Investigation Work Plan Submitted	December 2000
Groundwater Extraction System Shut Down	February 12, 2001
Monitored Natural Attenuation Quarterly Sampling	March, June, September, and December 2001
Monitored Natural Attenuation Summary Report	September 2001
Monitored Natural Attenuation Investigation at Synertek Building No. 1, Quarterly Sampling Data Submitted	May, October, and November 2001
Second Five-Year Review Submitted	April 2002

III. Background

Physical Characteristics

The Site is located on a 1.5-acre leased property at 3050 Coronado Drive in Santa Clara, California. A Site location map is provided as Figure 1. This Site is located in an industrial park dominated by the electronics industry, particularly semiconductor manufacturing. As such, the majority of the area is developed, and contains large paved areas for streets and parking. The nearest residential areas are located approximately 3,600 feet south of the Site, with other residential areas located about 6,000 feet to the north-northeast. None of these areas is within the area impacted by past chemical releases from the Site.

Land and Resource Use

The Site was leased in 1974 by Synertek, a semiconductor manufacturer that was subsequently acquired by Honeywell in 1979 as a wholly owned subsidiary. In 1985, Synertek ceased semiconductor-manufacturing operations, and the building was vacated. Currently, Honeywell does not use the Site, although several commercial enterprises occupy Building No. 1.

Subsurface investigations performed at the Site indicate that it is underlain by a lithologically complex multiple-aquifer system consisting of alternating sand and clay layers interbedded with silty clay and silty sand. Three aquifer zones were identified and designated as the A, B, and B1 aquifers.

The A-zone aquifer and B-zone aquifer are separated by an approximately 10-foot-thick sandy and silty clay aquitard. The B-zone aquifer and the B1-zone aquifer are separated by an approximate 60-foot-thick clay aquitard. These shallow zone aquifers are separated from the Regional Aquifer (Santa Clara groundwater basin) by an approximate 63-foot-thick clay aquitard. The Santa Clara Valley groundwater basin provides up to 50 percent of the

municipal drinking water for the residents of the Santa Clara Valley. The location is a National Priorities List (NPL) Site primarily because of the potential threat of past chemical releases to the quality of this valuable resource.

History of Contamination

Between 1974 and 1982, one 200-gallon underground storage tank and three neutralization tanks were associated with the semiconductor manufacturing operations. The 200-gallon tank was used for storage of volatile organic compounds (VOCs), specifically trichloroethylene (TCE) and trichloroethane (TCA), and the neutralization tanks were employed for wastewater treatment. A Remedial Investigation (RI) report determined that discharges of chlorinated organic compounds from these tanks have led to shallow groundwater contamination beneath the Site.

In 1982, the CRWQCB conducted a survey of underground storage tanks in the Santa Clara Valley. Honeywell submitted a completed facility questionnaire describing the underground solvent storage tank at the Site. At CRWQCB's request, Honeywell conducted soil borings in the vicinity of the underground tank and found evidence of leakage that was contaminating the surrounding soil and shallow groundwater with VOCs, specifically TCE and TCA.

Initial Response

Honeywell implemented a groundwater extraction and treatment system in 1985, and excavated the three underground storage tanks along with contaminated soils onsite. In June 1987, Honeywell began operating an onsite groundwater extraction and treatment system as an Interim Remedial Measure (IRM) to remove VOC-contaminated groundwater. Extracted groundwater was treated using a two-tower air stripper in series mode, and the treated groundwater was discharged by way of a National Pollution Discharge Elimination System (NPDES) permit.

On July 15, 1987, the CRWQCB issued SCR Order No. 87-084 for the Site. The order included provisions to characterize the groundwater contamination; complete horizontal and vertical plume definition; locate and seal abandoned agricultural wells; evaluate interim remedial activities and modification; initiate and complete onsite and offsite interim remedial actions; and to establish a Quality Assurance Project Plan (QAPP) and a Health and Safety Plan.

CRWQCB Order No. 87-084 was replaced on June 21, 1989, with Order No. 89-113 for the Site. This order included provisions to develop an administrative record for the Site, as well as updated quarterly progress monitoring requirements, and Remedial Investigation/Baseline Public Health Evaluation (RI/BPHE) and Feasibility Study/Remedial Action Plan (FS/RAP) requirements. In September 1989, the Site was placed on the NPL by the U.S. Environmental Protection Agency (USEPA).

On October 1, 1990, an RI/ BPHE was submitted for the Site, and based on the conclusions of the RI/BPHE, a Feasibility Study (FS) was also submitted. Identification and screening of 23 remedial technologies were presented in the FS, and four of these technologies were selected for remedial alternatives. Based on the evaluation of the four remedial alternatives, the results of the FS concluded that the air stripping technology would be maintained because it

was currently used as part of the IRM and was effective in treating the VOC-impacted groundwater. The treated groundwater would continue to be discharged under the NPDES.

On March 20, 1991, the CRWQCB issued a revised SCR Order No. 91-051, which incorporated a Final Remedial Action Plan that continued groundwater extraction until drinking water standards are met; continued treatment of extracted groundwater with the existing air stripping unit; and continued quarterly groundwater monitoring at the Site during the cleanup period.

Basis for Taking Action

The basis for taking action as listed in the SCR Order No. 91-051 is as follows:

“The Site overlies the Santa Clara Valley groundwater basin. Groundwater from this basin provides up to 50 percent of the municipal drinking water for the 1.4 million residents of the Santa Clara Valley. In 1989, groundwater accounted for approximately 128,000 of the 315,000 acre feet of drinking water delivered to Santa Clara Valley Water District customers. Synertek #1 is a Superfund site primarily because of the past chemical releases’ potential threat to the quality of this valuable resource.”

Since the shallow zone groundwater from beneath the Site is not currently used for drinking water supply, no current human health risk was identified at the Site. Potential future health risks are based on exposures that could potentially occur in the future if untreated shallow zone groundwater was used for human consumption; if residential development occurred on the Site; and the potential future health risk related to the potential for migration from the shallow zone aquifers to the regional drinking water aquifer.

IV. Remedial Actions

This section summarizes the status of the remedial actions since the last review and discusses the intended future progress of the action. Information on previous remedial action at the Site is provided in the *First Five-Year Review*. Completion of the remedial action implementation, system operations and maintenance (O&M), and the progress since the last review is provided below.

The goal of the remedial action at the Site is to restore groundwater to its beneficial uses. Other goals include:

- Groundwater extraction shall continue as long as it removes significant quantities of chemicals.
- During the operation of the groundwater remediation system, verify that cleanup is proceeding and that there is no migration of VOCs, above cleanup standard levels, beyond current boundaries or into the deeper B1 zone.

Summary of Remedial Action During Period of Second Five-Year Review

Operation of the GETS continued at the Site from January 1996 through February 2001, at which point the system was shut off in conjunction with the initiation of a MNA program.

Current Status of Remedial Action

On September 29, 2000, the CRWQCB and Honeywell jointly evaluated the feasibility of continued operation of the GETS. Based on the findings of this joint evaluation, it was determined that the continued operation of the extraction system was not warranted. In January 2001, the CRWQCB approved the December 2000 Proposed *Monitored Natural Attenuation Investigation Work Plan* prepared by IT Corporation (IT, 2000). The plan proposed a year-long trial period during which the GETS at the Site would be shut down. The purpose of the study was to investigate if MNA is an effective method for remediating the VOC plume at the Site.

The results of this year-long MNA study are presented in the *Monitored Natural Attenuation Investigation Annual Summary Report* dated April 2002. Pending approval of the recommendations presented in that report and this *Second Five-Year Review Report*, the GETS will remain out of operation and long-term MNA may be implemented and further evaluated.

System Operations and Maintenance (O&M)

Regular O&M of the remedial system was ongoing from 1987 through early 2001, until the MNA study was implemented. Actual O&M costs for 1996-2001 are presented in Table 2 below.

TABLE 2

Annual System Monitoring, Operation, and Maintenance Costs
Honeywell Synertek Building No. 1, Santa Clara, California

Year	Sampling	O&M	Total
1996	\$50,710	\$63,877	\$114,587
1997	\$26,035	\$37,465	\$63,500
1998	\$37,662	\$63,877	\$101,540
1999	\$51,324	\$61,316	\$112,648
2000	\$51,957	\$69,706	\$121,663
2001	--	--	\$92,647
TOTAL:			\$606,585

Note: Costs for 2001 reflect the cessation of groundwater extraction and implementation of a monitored natural attenuation program.

V. Progress Since the Last Five-Year Review

The *First Five-Year Review Report*, submitted in 1996, concluded that from January 1991 through December 1995, approximately 32 million gallons of groundwater had been extracted and approximately 64 pounds of VOCs had been removed, the majority of that (approximately 40 pounds) in 1991 (Groundwater Technology Inc., 1996).

Since the *First Five-Year Review Report* was submitted, the GETS has continued to hydraulically control and treat groundwater. From 1996 through the end of 1999, approximately 40 million gallons of groundwater were extracted, from which approximately 19.5 pounds of VOCs were removed. The amount of groundwater extracted versus the mass of total VOCs removed continues to be significantly low, which indicates that asymptotic levels of the contaminant levels have been reached and that further reduction of VOCs in groundwater using pump and treat technology will not be significant.

Except for periods of major maintenance when the extraction and treatment system had to be turned off, groundwater extraction has been relatively constant. Over the life of the GETS, the system has reduced the concentration of TCE in the A and B aquifers by 93 and 99 percent, respectively (IT, 2000).

Over the last five years, the mass removal rate of the GETS has declined, and appears to have reached asymptotic levels. This leveling indicates that the system is no longer removing contaminants from the groundwater and, therefore, an MNA program was initiated in February 2001.

VI. Five-Year Review Process

This section summarizes the overall review process, including activities that involve the community and those tasks completed to conduct the review process.

Document Review

To complete the second five-year review, the following Site documents were reviewed:

- *San Francisco Bay Basin, Region II, Water Quality Control Plan*, November 1995
- *Five-Year Status Report*, Groundwater Technology, Inc., January 1996
- *Fourth Quarter 1996 Progress Report and Evaluation of Site Cleanup Measures*, IT Corporation, January 1997
- *Report of Monitoring and Sampling*, July through December 1998, and *Evaluation of Cleanup Measures*, IT Corporation, January 1999
- *Report of Monitoring and Sampling*, July through December 1999, IT Corporation, February 2000
- *Report of Monitoring and Sampling*, July through December 2000, Honeywell International Inc., Synertek, Building 1, IT Corporation, December 2000
- *Proposed Monitored Natural Attenuation Investigation Work Plan*, IT Corporation, December 2000
- *Report of Monitoring and Sampling*, July through December 2000, IT Corporation, March 2001
- *Monitored Natural Attenuation Investigation Annual Summary Report*, CH2M HILL, April 2002

Results and conclusions of these reports have been integrated in this document.

Groundwater Monitoring Review

Groundwater monitoring data collected from 1996 to 2001 were reviewed to 1) evaluate the extent of the VOCs in the A and B aquifers; 2) evaluate variations in total target VOC concentrations; and 3) summarize the findings of the MNA investigation performed in 2001. Based on the findings of the review, observations are presented regarding the potential to achieve the goals of the selected remedy.

Extent of the VOC Plume

The dissolved total target VOC plume within the A aquifer historically has occurred as an elongated plume with its axis running between extraction wells PW-1 and PW-4. Historically, the highest VOC concentrations are found in wells 12A, 26A, and PW-4. In the B aquifer, the extent of VOCs is limited to a small area along the western side of Building 1. The highest dissolved total target VOC concentrations in the B aquifer are found in well 4B near the west wall of Building 1. In the B1 aquifer, VOCs have not been detected.

The concentrations of total target VOCs in the A and B aquifers from 1996 through 2001 are presented in Figures 2 through 13. The data used to develop the figures were presented in the annual progress reports for the Site as listed in the Document Review section of this five-year review. In the B1 aquifer, no VOCs were detected.

The data from 1996 through 2001 indicate that the distribution of VOCs is similar to historical distributions. In the A aquifer, VOCs are found along an elongated area between PW-1 and PW-4. In the B aquifer, the extent of VOCs is still limited to a small area along the western side of Building 1.

Target VOC Concentrations

To help understand data trends over time, time-series plots were developed showing total target VOC concentrations versus time in selected wells in the A and B aquifers. These plots are presented in Figures 14 through 19. The selected wells represent concentrations upgradient of the plume, the mid-plume area, the area immediately downgradient of the plume, and the area at a distance downgradient. For wells where all target VOCs were below detectable levels, one-half the maximum detection limit for the target chlorinated VOCs was assigned as the concentration value in the time-series plots.

Aquifer A- Upgradient. Figure 14 shows that total target VOCs at upgradient well 1A decreased from low detectable levels in 1996 to below detection in 1998. Other than a low level detection in 2000, total target VOCs remained nondetect since 1998. Total target VOC concentrations were below detection limits after the GETS was turned off in February 2001.

Aquifer A- Mid-Plume. Figure 15 shows that total target VOC concentrations decreased in both wells 7A and 12A from 1996 to 1998. Since 1999, total target VOCs in well 7A have been stable at about 30 micrograms per liter ($\mu\text{g/L}$). In well 12A, total target VOCs had been increasing since 1998. However, after the GETS was turned off in February 2001, total target VOC concentrations in that well dropped significantly.

Aquifer A- Downgradient (Near). Figure 16 shows that total target VOC concentrations in the downgradient area of the plume fluctuated significantly between nondetect values to fairly high detected values. After the GETS was turned off in February 2001, total target VOC concentrations increased in two wells (29A and 25A) and decreased in one well (30A) slightly crossgradient.

Aquifer A- Downgradient (Far). Figure 17 shows that total target VOC concentrations in wells downgradient of the plume fluctuated between nondetect values to low detected values. Total target VOCs decreased to below detectable levels in well 34A and remained below detection in well 33A after the GETS was turned off in February 2001.

Aquifer B. Figure 18 shows that total target VOC concentrations at well 4B were increasing between 1996 and 1998. However, between 1998 and 2000, total target VOCs decreased by an order of magnitude. After the GETS was turned off in February 2001, total target VOCs have increased almost one order of magnitude (from 181 to 882.5 µg/L).

Figure 19 shows that total target VOC concentrations at well 12B were decreasing between 1996 and 1998. Between 1998 and 2000, total target VOCs increased but remained low (< 9 µg/L). After the GETS was turned off in February 2001, total target VOCs decreased to below detection.

MNA Investigation – Summary Findings

The MNA processes evaluated included intrinsic biological degradation, retardation as a result of adsorption of contaminants to the soils matrix, and dilution and dispersion. Detailed information and findings of the MNA investigation are presented in the *Monitored Natural Attenuation Investigation, 2001 Summary Report*, dated April 2002. In summary, the findings of that investigation are:

- Intrinsic anaerobic biodegradation of the VOCs is occurring; however, additional data trends are required to further assess the biodegradation of VOCs at the site via electron donors such as natural or anthropogenic carbon.
- Degradation byproducts such as ethene and vinyl chloride are not found in high concentrations. Additional data trends will further define the biodegradation rate. It should be noted that daughter products that are degradable under aerobic conditions (vinyl chloride) could be undergoing some degradation.
- Adsorption of contaminants to the soil matrix is reducing the rate at which the contaminants migrate from the source area. Using calculated retardation coefficients, contaminant transport rates range from approximately 1/2 to 1 times the groundwater flow rate. The contaminant plume will continue to dilute and disperse, and will reach a stable size over time.

Groundwater Data Review - Conclusions

The results of the data review indicate the following:

- Although the concentration of TCE in the A and B aquifers has been reduced by 93 and 99 percent, respectively, the extent of VOCs in the A and B aquifer has remained generally similar over the last five years.

- In the A aquifer, upgradient total target VOC concentrations demonstrate a decreasing trend from low detected levels to nondetections. In the other areas of the aquifer, total target VOC concentrations generally decreased from 1996 to 1998, but fluctuate considerably after 1998.
- In the B aquifer, total target VOC concentrations decreased considerably in well 4B since 1998. In well 12B, by contrast, total target VOC concentrations have increased since 1998. After the GETS was turned off in February 2001, total target VOCs increased from 181 to 882.5 µg /L in well 4B but decreased to below detection in well 12B.
- In the B1 aquifer, VOCs are not found.

These results demonstrate that the extent of contamination has not increased in either aquifer and has actually decreased in the areas upgradient of aquifer A over the last five years. Operation of the GETS has been effective in significantly reducing contaminant concentrations in both the A and B aquifers. Overall, the GETS is protective of human health and the environment, has reduced the volume and mobility of the VOCs, and has been effective over the 14 years of operation. However, since 1998, data indicate contaminant levels have not continued to be further reduced, and the GETS performance appears to be reaching asymptotic levels. Therefore, continued operation of the GETS is not expected to further reduce contaminant concentrations to a significant degree.

In view of the diminishing benefits of sustained GETS operation, continuing with a MNA approach may be a viable long-term strategy for the Site. Future MNA data trends are required to fully assess MNA as a long-term strategy.

Groundwater Monitoring Review - Areas of Concern

The area between wells 12A and 29A is the primary area of focus in the A aquifer, and is important in evaluating the effectiveness of MNA. Data from wells in this area would provide the earliest indications of the effects that turning off the GETS may have on plume migration.

In the B aquifer, wells downgradient of well 4B would provide the earliest indications of the effects that turning off the GETS may have on plume migration and the effectiveness of MNA.

Groundwater Monitoring Review - Areas of Compliance

Review of the most recent monitoring data indicates the plume is stabilizing and not increasing in size. Concentrations of chemicals of concern (COCs) have been reduced significantly over the course of the operation of the GETS; however, there are still exceedances of the final cleanup standards (FCSs - Order No. 91-051) at individual wells. Table 3 lists the COCs found above FCSs in the most recent sampling and the locations of those FCSs exceedances.

TABLE 3

COCs Found Above FCSs in Most Recent Sampling (Concentration in µg/L)

Constituent	A Aquifer Wells	B Aquifer Wells
1,1 – DCA FCS = 5	12A – 7 (12/2001) 19A – 8 (1/2000) 25A – 6.8 (8/2000) 26A – 9 (12/2001) 29A – 12 (12/2001) 36A – 58 (8/2000) PW-4 – 19 (12/2001) PW-5 – 15 (1/2000)	4B – 47 (12/2001)
1,1 – DCE FCS = 6	08A – 6 (1/2000) 17A – 10 (1/2000) 19A – 20 (1/2000) 25A – 25 (12/2001) 26A – 18.6 (8/2000) 29A – 12 (12/2001) 36A – 16 (8/2000) PW-4 – 49 (12/2001) PW-5 – 28 (1/2000)	4B – 26 (12/2001)
Cis- 1,2 – DCE FCS = 6	08A – 10 (1/2000) 17A – 7 (1/2000)	4B – 93 (12/2001)
TCE FCS = 5	02A – 66 (1/2000) 03A – 9 (1/2000) 07A – 22 (12/2001) 08A – 15 (1/2000) 11 A – 5.7 (8/2000) 12A – 7 (12/2001) 17A – 41 (1/2000) 19A – 15 (1/2000) 26A – 54.2 (8/2000) 36A – 8.8 (8/2000) PW-1 - 17 (1/2000) PW-4 – 57 (12/2001)	4B – 679 (12/2001) PW-3 – 5J (12/2001)
Vinyl Chloride FCS = 0.5	17A – 7 (1/2000) 36A – 0.7 (1/2000)	4B – 1.7 (12/2001)

Spatially in the A aquifer, the FCS exceedances are found in a narrow elongated area between well 7A to the south and well 29A about 1,100 feet to the north of well 7A. East-west, the plume is bounded by well 15A to the east and well 18A about 300 feet to the west. At well 29A, the furthest downgradient well, 1,1,-DCA and 1,1-DCE (daughter products of TCE biodegradation) are the only chemicals above FCSs and are at fairly low levels. In the B

aquifer, FCS exceedances are limited to the immediate vicinity of well 4B. Groundwater outside these areas and in the B1 aquifer is within compliance relative to the FCSs.

Community Involvement Activities

Community involvement was completed during the initial phases of this project, including public notices, comment periods, meetings, and fact sheets. No community involvement has occurred during the past five years.

Site Inspections

During the period the GETS was in operation, inspections of the Site were conducted weekly. Since the pump and treat system has been shut down, Site inspections occur quarterly when groundwater monitoring takes place. The scope of the Site inspections includes monitoring for evidence of surface chemicals, Site and well security, vegetation status, and adjacent activity that could impact the Site. In general, Site inspections did not disclose any extraordinary observations or occurrences.

VII. Technical Assessment

The technical assessment section assesses the effectiveness of the remedy. The purpose of the assessment is to determine whether or not the remedy is, or is not expected to be, protective of human health and the environment. This determination is intended to examine whether or not the remedy is achieving, or is expected to achieve, the remedial action objectives (RAOs) stated in the Consent Order (CO No. 91-051).

The determination of effectiveness is made by answering three key questions specified in USEPA's *Comprehensive Five-Year Review Guidance* (USEPA 540-R-01-007), June 2001:

Question A Is the remedy functioning as intended by the decision documents?

Question B Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?

Question C Has any other information come to light that could call into question the protectiveness of the remedy?

The text in this section is structured around these three questions.

Question A – Is the remedy functioning as intended by the decision documents?

The remedy for this Site has included operation of the GETS (1986 to February 2001) with follow-on MNA since February 2001. These actions are protective of human health and the environment and have reduced the volume and mobility of the VOCs in groundwater. However, after 14 years of operation, the GETS performance appears to be reaching asymptotic levels.

In view of the diminishing benefits of sustained operation of the GETS, continuing with a MNA approach may be a viable long-term strategy for the Site. During 2001, the results of the MNA evaluation indicated that the extent of contamination did not increase and MNA may be a protective long-term program. Additional data trends will be used to further

evaluate MNA as the remedial option. Treating the remaining contaminants in situ via natural (or enhanced) MNA processes, would eliminate the need to pump, treat, and discharge water.

Question B – Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?

Yes.

No changes in exposure pathways, toxicity, or other contaminant characteristics have occurred. The FCSs for the Site were reviewed and compared to those promulgated in the San Francisco Bay Basin (Region 2) Water Quality Control Plan, November 1995. No changes in the maximum contaminant levels (MCLs) were noted and the FCSs, therefore, remain the same.

Question C - Has any other information come to light that could call into question the protectiveness of the remedy?

No.

No additional information has been revealed that affects the protectiveness of the remedy.

VIII. Issues

Two issues have been noted during the second five-year review:

- The GETS is no longer effectively removing VOCs.
- Due to the short duration of the MNA program, it is uncertain whether natural attenuation processes will effectively achieve plume stabilization and reduction.

IX. Recommendations and Followup Actions

The purpose of this section is to summarize areas of concern in current Site operations and identify needed actions. Although none of these concerns is believed to be an immediate or short-term threat to human and environmental health, they represent areas that may potentially result in the remedial action not being protective in the future. In general, the needed actions include continued monitoring and implementing additional remedial actions as necessary. The issues and actions needed are as follows:

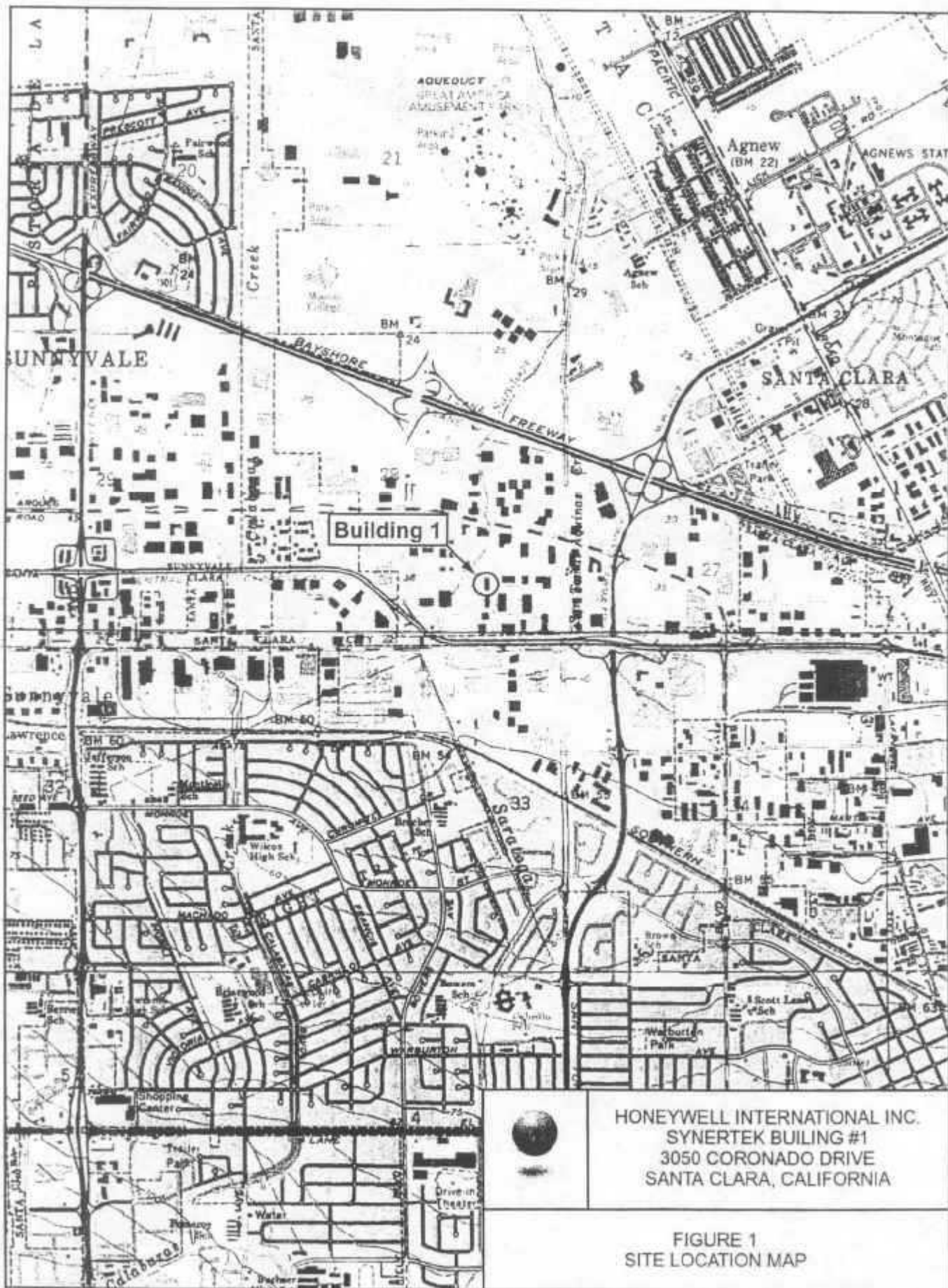
- Performance of the GETS appears to be reaching asymptotic levels and the system is no longer an effective remedy for the Site. Therefore, it is recommended that operation of the GETS be discontinued.
- Results from the MNA study indicate that the plume is stabilizing and not increasing in size. Since there is no imminent threat to human health and the environment, it is recommended that the MNA program of 2001 (program started February 2001) be continued.

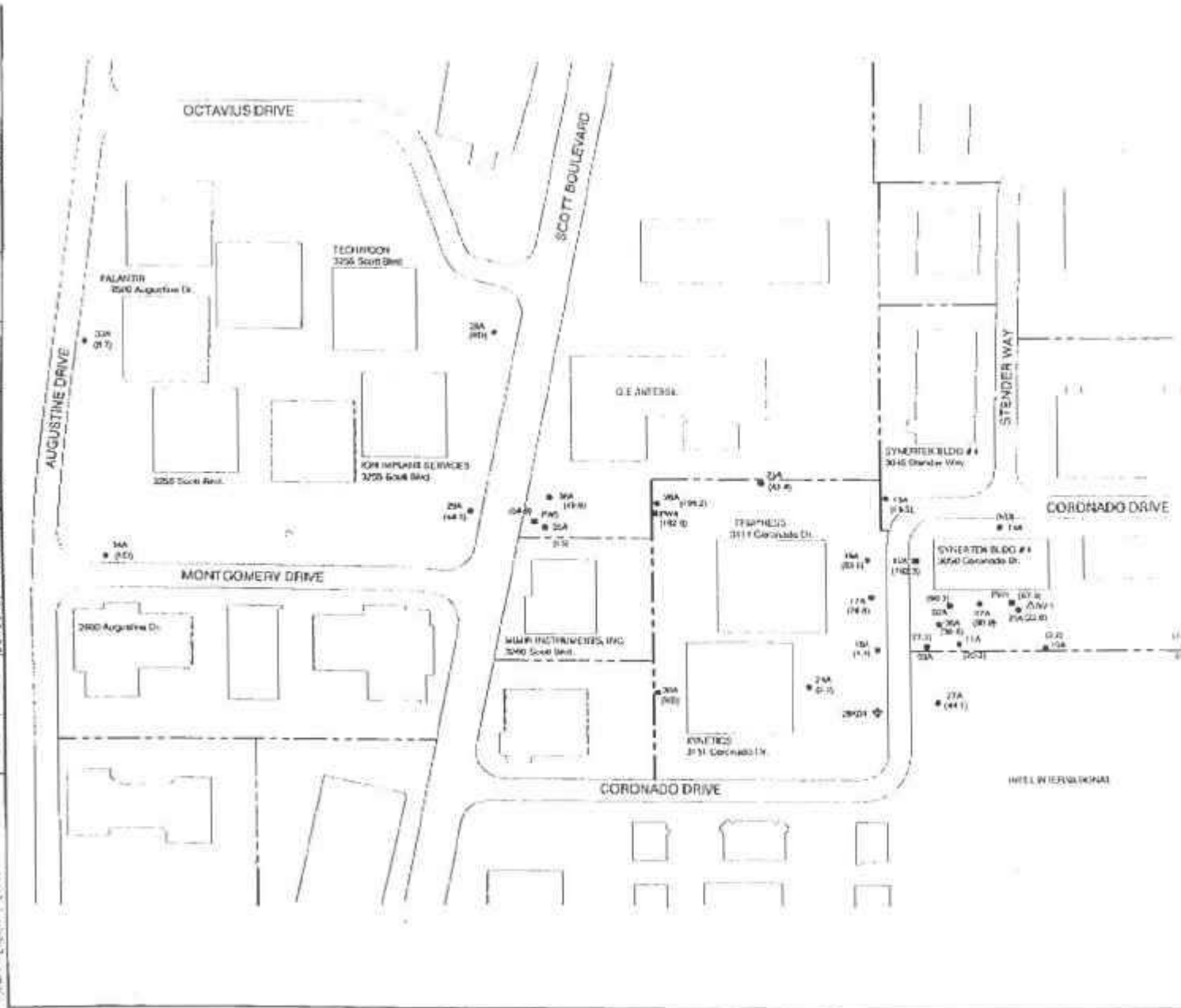
X. Protectiveness Statements

The current remedy of monitored natural attenuation at the Site protects human health and the environment. In general, contaminant levels in Site groundwater have decreased over time and either natural or enhanced natural attenuation processes are expected to further reduce contaminant levels on the Site. The groundwater remedy is expected to be protective of human health and environment upon completion, and immediate threats have been addressed.

XI. Next Review

The next five-year review is due April 2007.





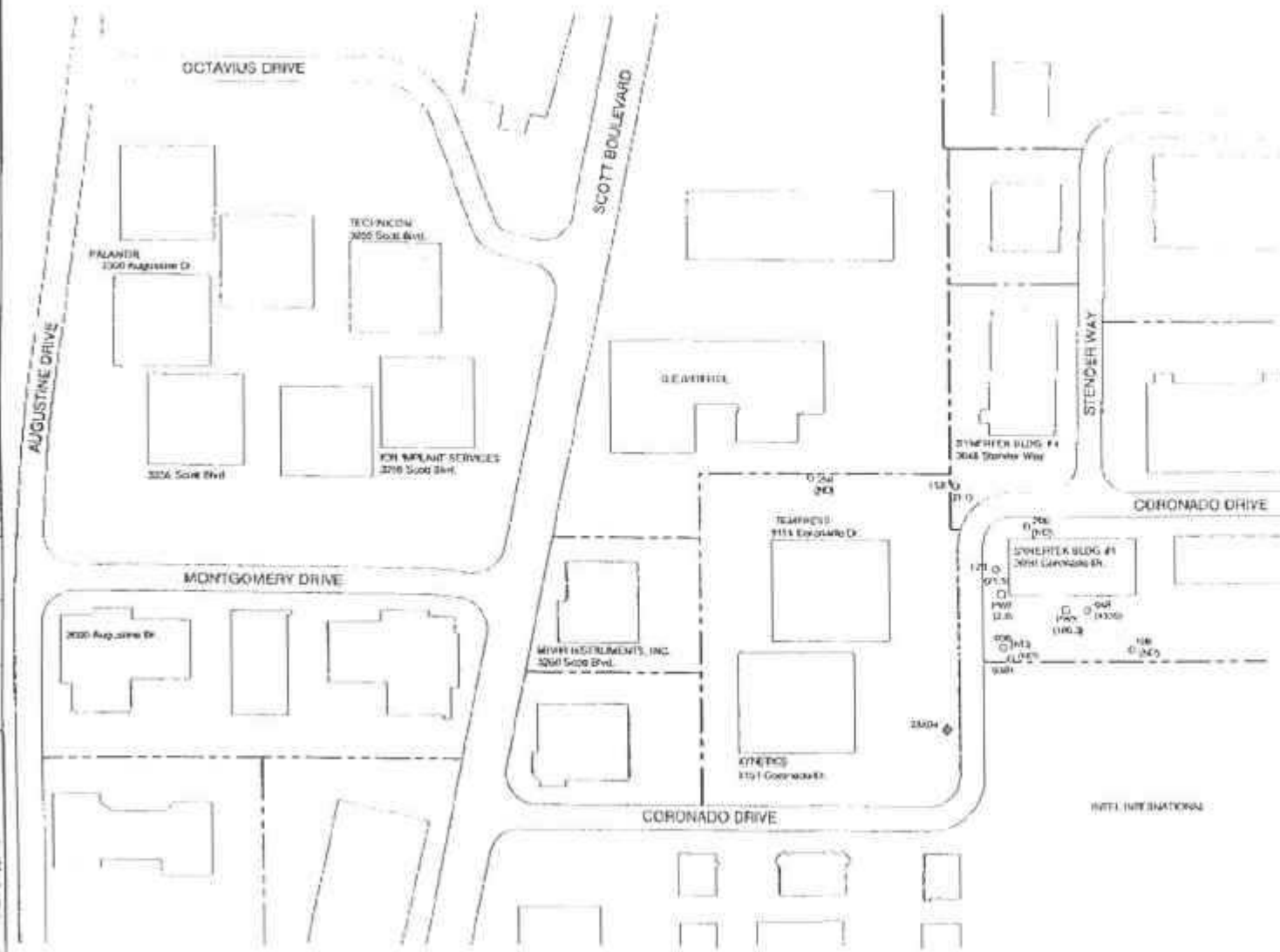
LEGEND

- AQUIFER MONITORING WELL
- AQUIFER EXTRACTION WELL
- FORMER AGRICULTURAL WELL
- △ INJECTION WELL
- () CONCENTRATION (µg/L)
- (ND) NOT DETECTED



HONEYWELL INC.
 SYNERTEX BUILDING #1
 3050 CORDONADO DRIVE
 SANTA CLARA, CALIFORNIA

FIGURE 2
 TOTAL TARGET VOCs
 AQUIFER (1996)



LEGEND

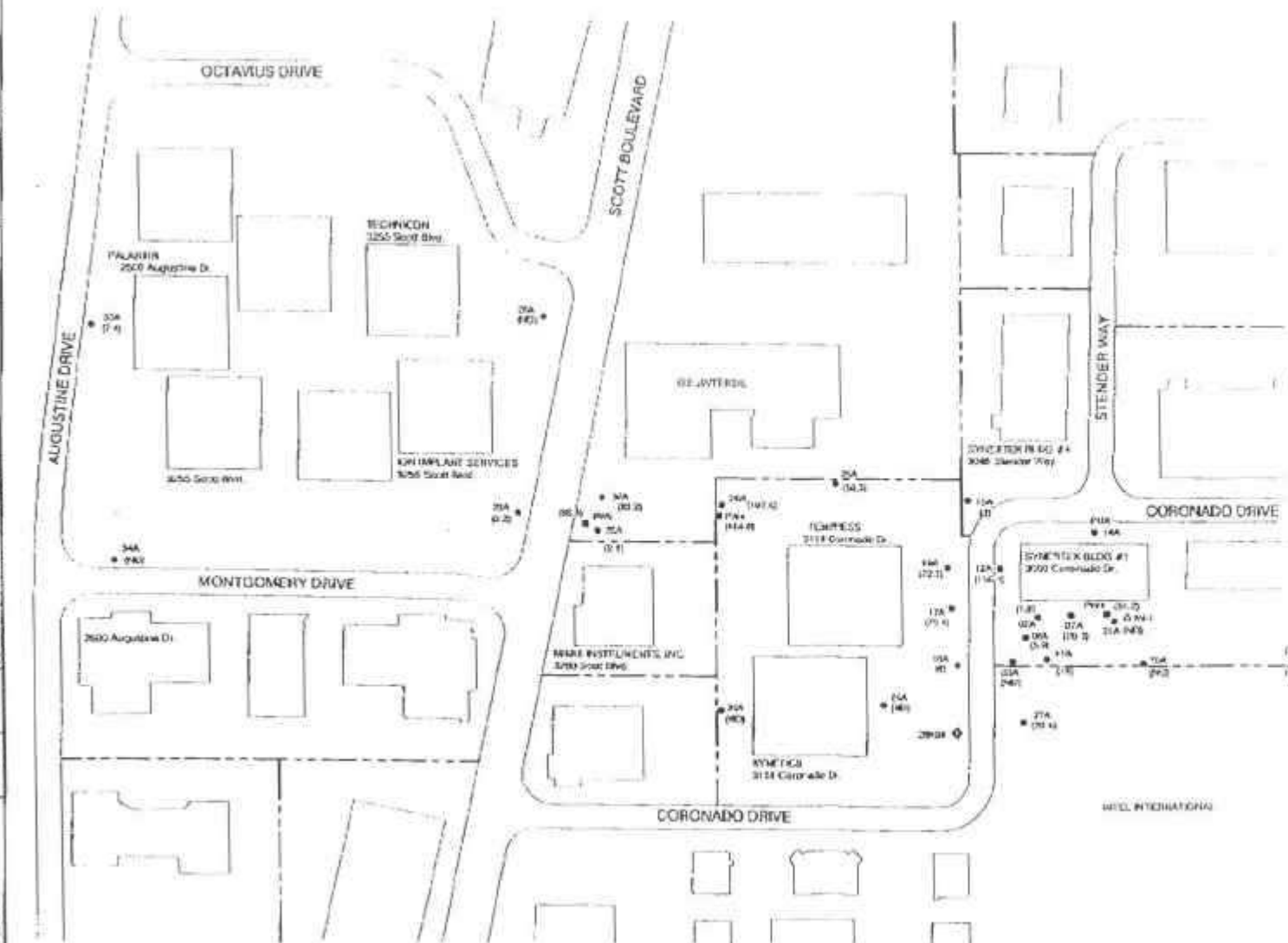
- BAGUER MONITORING WELL
- BAGUER EXTRACTION WELL
- FEDERAL AGRICULTURAL WELL
- INJECTION WELL
- CONCENTRATION (ug/L)
- NOT DETECTED

0 FEET 200
 SCALE



HONEYWELL INC.
 SYMPTER BUILDING #1
 3050 CORONADO DRIVE
 SANTA CLARA, CALIFORNIA

FIGURE 3
 TOTAL TARGET VOCs
 BAGUER (1995)



LEGEND

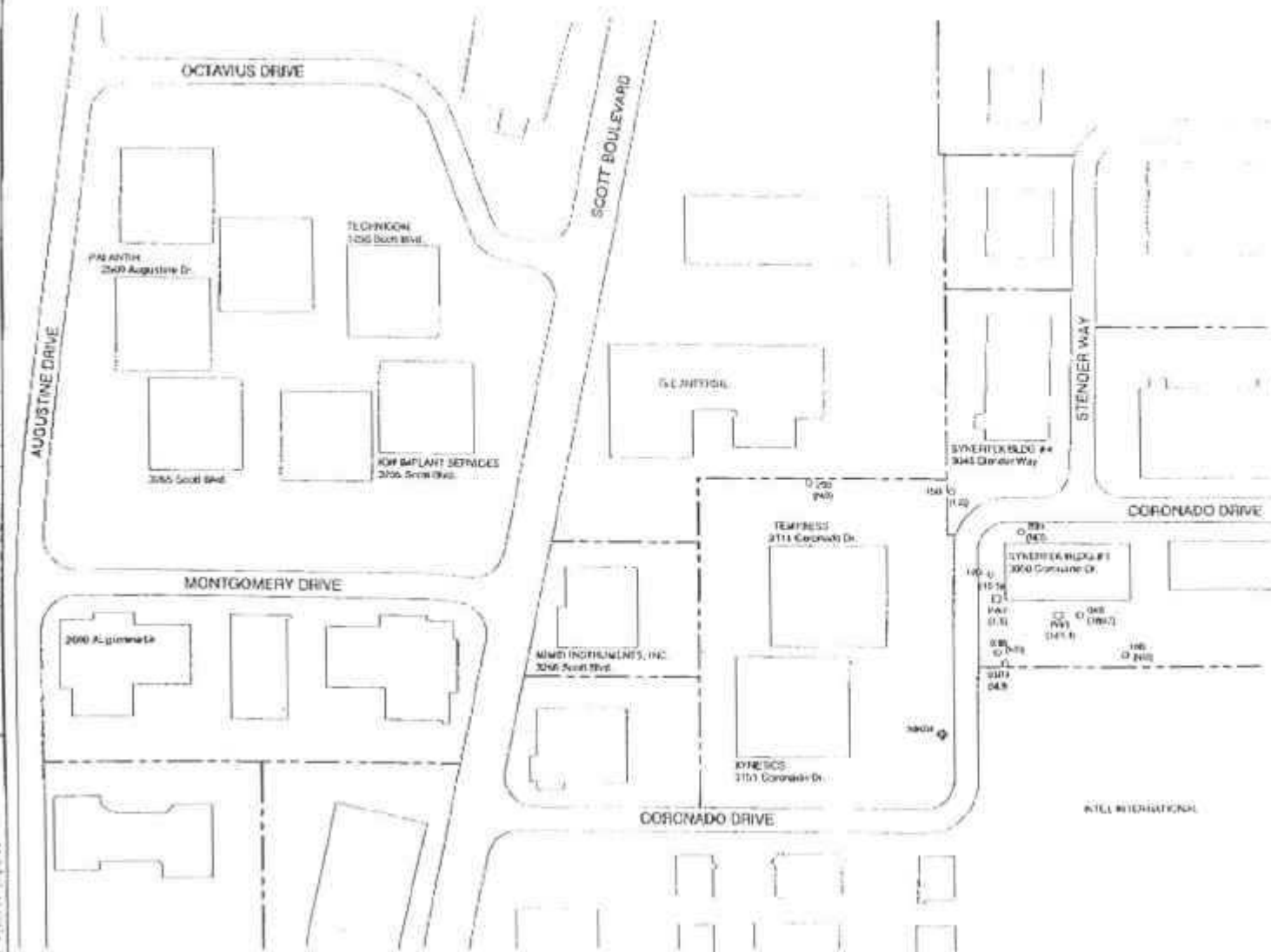
- A. AQUIFER MONITORING WELL
- A. AQUIFER EXTRACTION WELL
- ◊ FORMER AGRICULTURAL WELL
- △ INJECTION WELL
- (C.I.) CONCENTRATION (µg/L)
- (ND) NOT DETECTED

0 FEET 200
SCALE



HONEYWELL INC.
SYNERGY BUILDING #1
3000 CORONADO DRIVE
SANTA CLARA, CALIFORNIA

FIGURE 4
TOTAL TARGET VOCs
A. AQUIFER (1997)



LEGEND

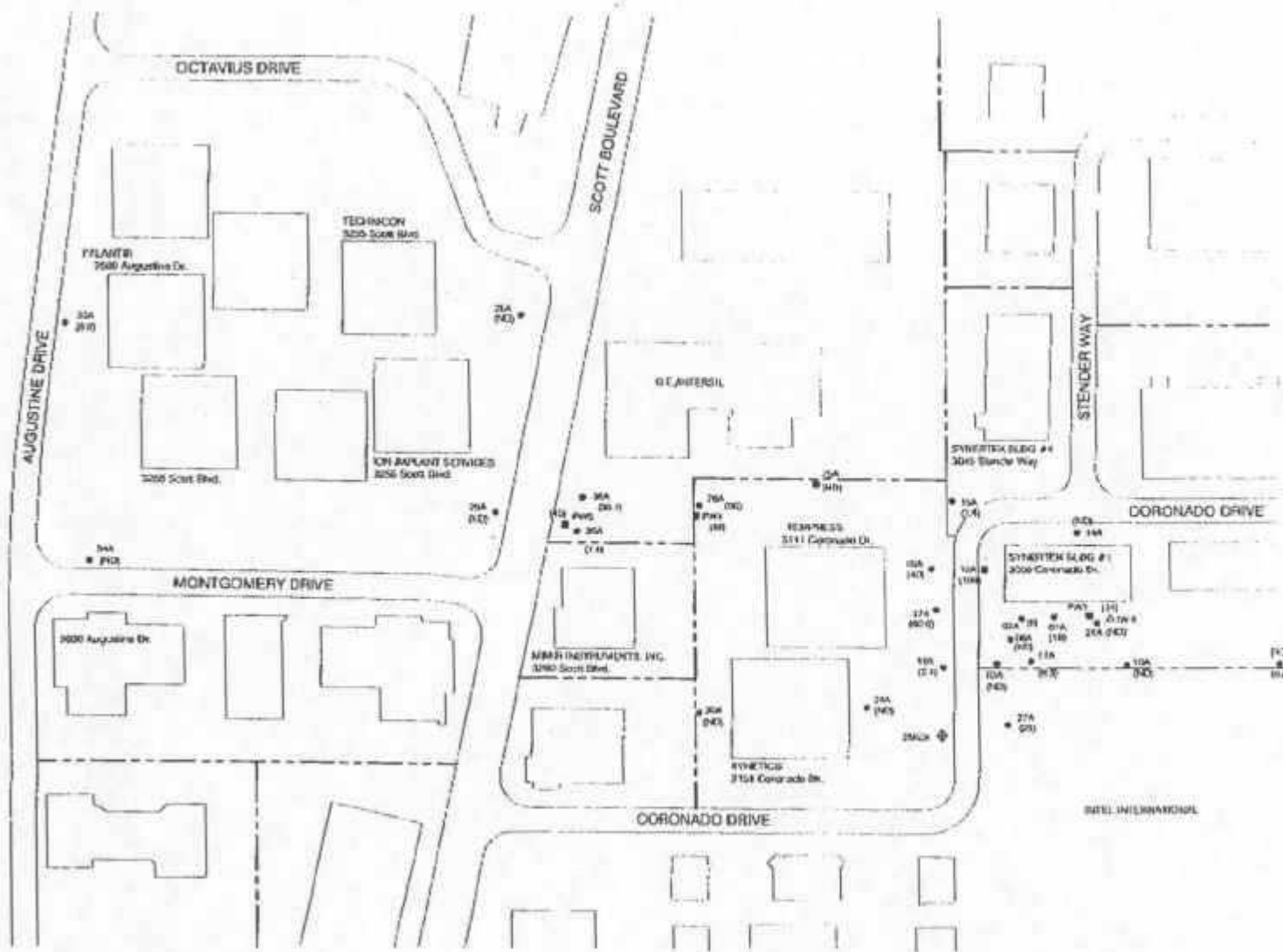
- ○ AQUIFER MONITORING WELL
- ○ AQUIFER EXTRACTION WELL
- ⊕ FORMER AGRICULTURAL WELL
- ⊕ INJECTION WELL
- () CONCENTRATION (µg/L)
- (ND) NOT DETECTED

0 100 200
SCALE



PROJECT: HWMA, INC.
 SYNERTEK BUILDING #1
 3050 CORONADO DRIVE
 SANTA CLARA, CALIFORNIA

FIGURE 5
 TOTAL TARGET VOCs
 @ AQUIFER (1997)



LEGEND

- A MONITORING WELL
- A MONITORING WELL
- ⊕ FORMER AGRICULTURAL WELL
- △ REJECTION WELL
- () CONCENTRATION (μg/L)
- NOT DETECTED

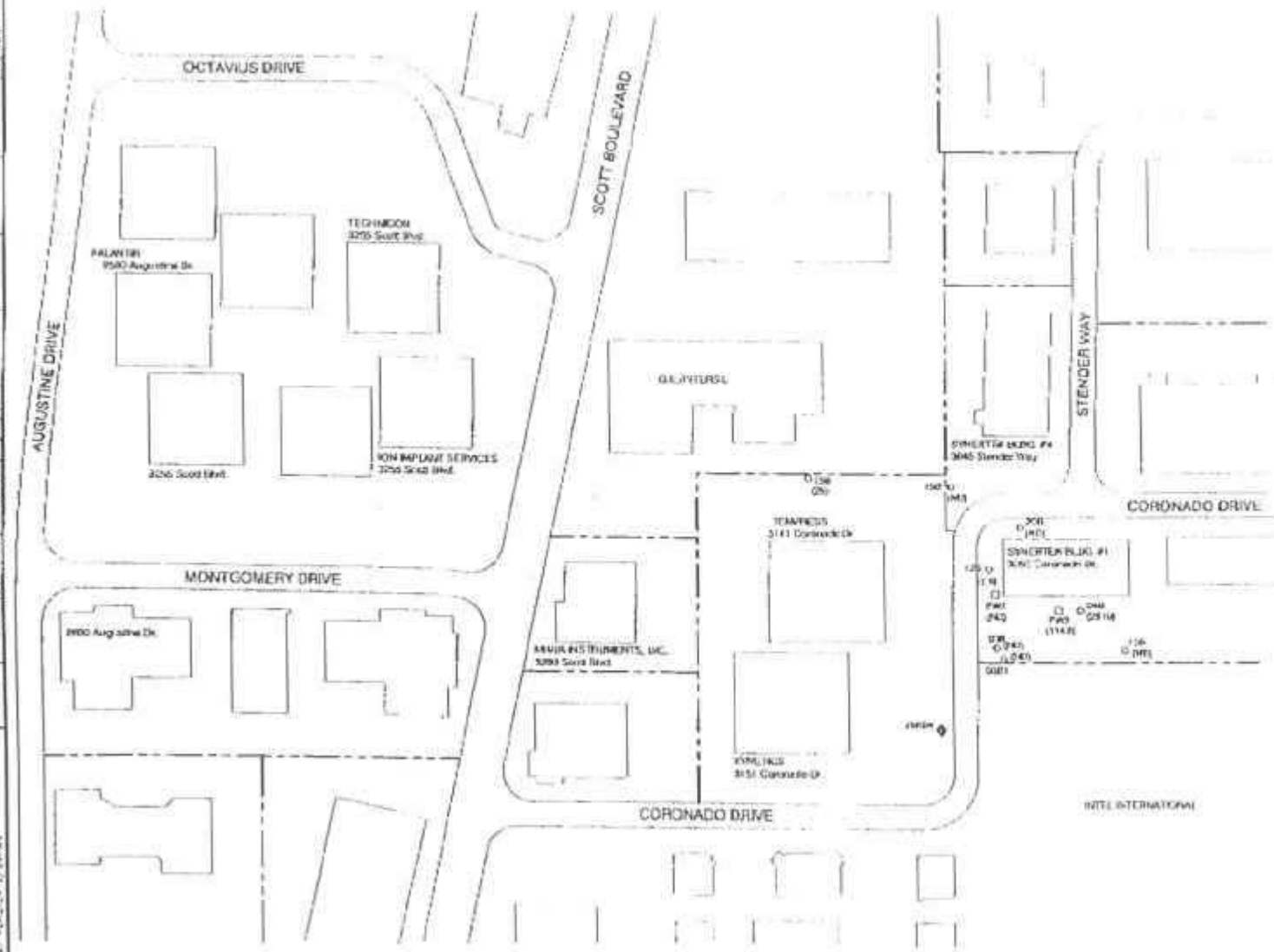
(ND)

0 100 200
 FEET
 SCALE



HONEYWELL INC.
 SYNTHETIC BUILDING #1
 3000 CORONADO DRIVE
 SANTA CLARA, CALIFORNIA

FIGURE 6
 TOTAL TARGET VOCs
 AQUIFER (1988)



LEGEND

- BARRIER MONITORING WELL
- ⊕ BARRIER EXTRACTION WELL
- ⊕ FORMER AGRICULTURAL WELL
- △ INJECTION WELL
- () CONCENTRATION (ppb)
- CONCENTRATION CONTOUR (DASHED WHERE INFERRRED)
- (ND) NOT DETECTED

0 100 200
FEET
SCALE



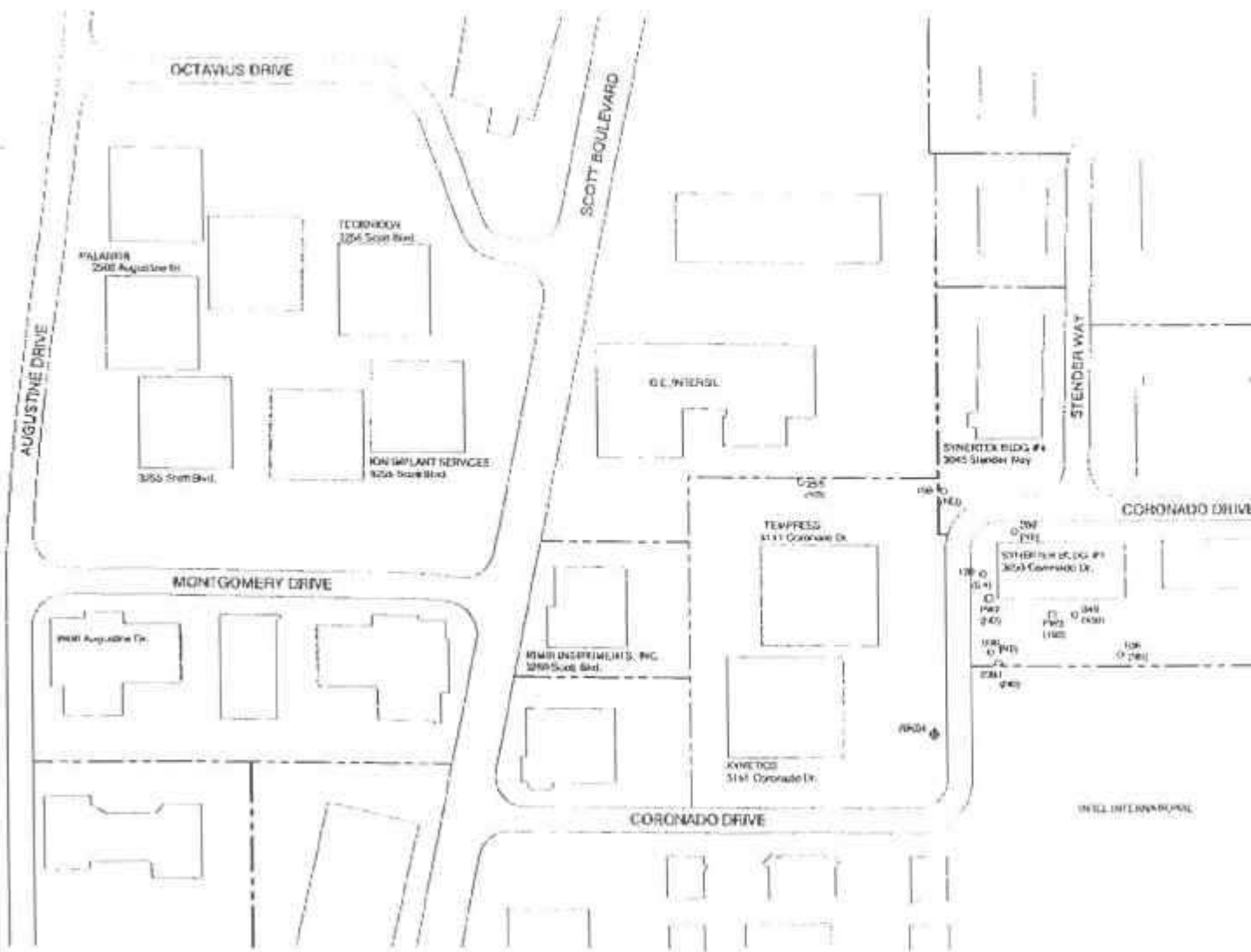
HONEYWELL INC.
SYNERTEK BUILDING #1
3050 CORONADO DRIVE
SANTA CLARA, CALIFORNIA

FIGURE 2
TOTAL TARGET VOC'S
B AQUIFER (1998)



HONEYWELL INC.
SYNERTEK BUILDING #1
3050 CORCORADO DRIVE
SANTA CLARA, CALIFORNIA

FIGURE 8
TOTAL TARGET VOCS
IN AQUIFER (1999)



LEGEND

- (B) B AQUIFER MONITORING WELL
- (E) B AQUIFER EXTRACTION WELL
- (A) FORMER AGRICULTURAL WELL
- (I) INJECTION WELL
- (C) CONCENTRATION (ppm)
- (ND) NOT DETECTED

0 FEET 200 SCALE



HONEYWELL INC.
SYNEXTEK BUILDING #1
3050 CORONADO DRIVE
SANTA CLARA, CALIFORNIA

FIGURE 9
TOTAL TARGET VOCs
B AQUIFER (1999)

DRAWING NUMBER
HWMNA-07.5

APPROVED BY

CHECKED BY

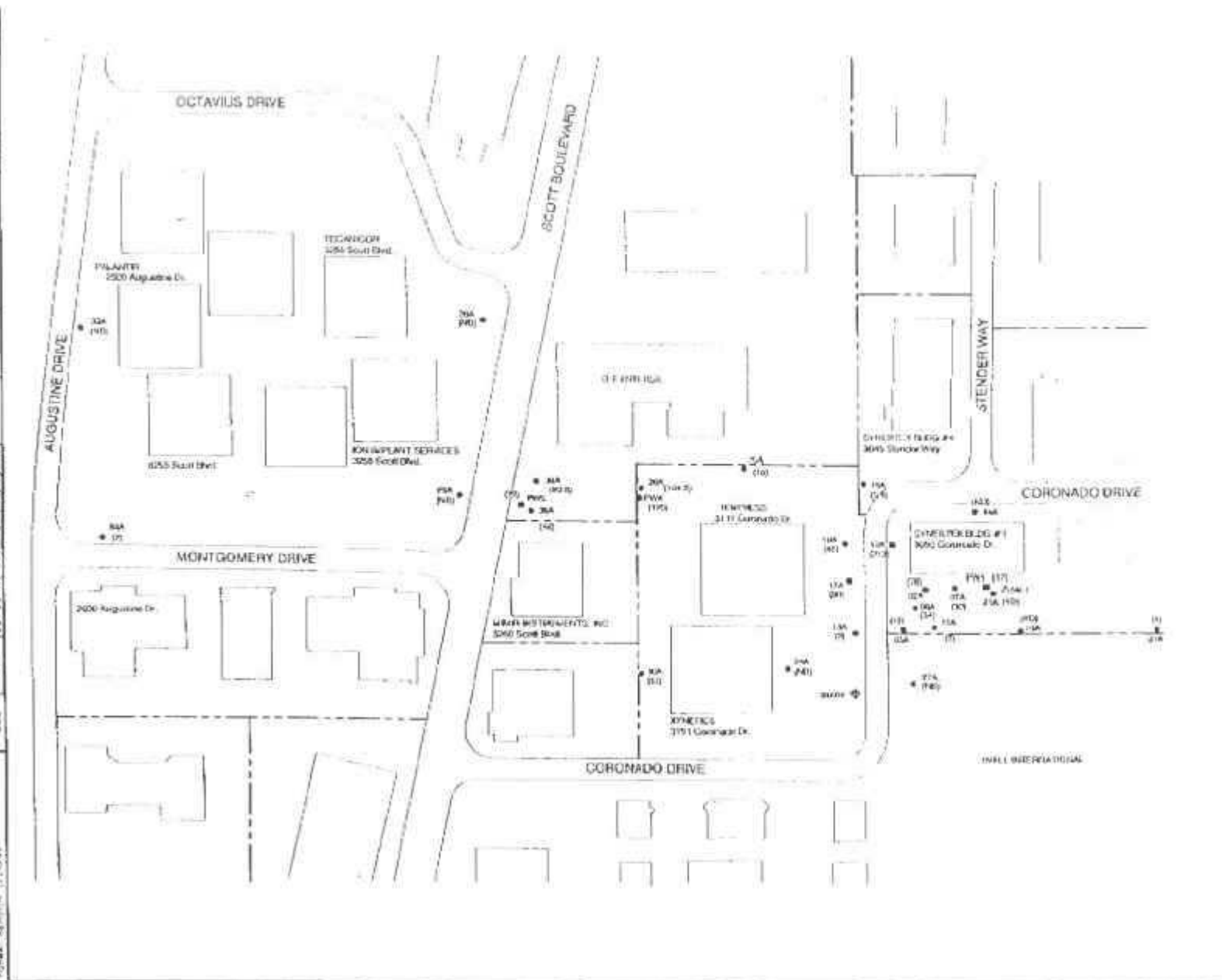
DRAWN BY

DATE

IMAGE

FORMAT

DATE



LEGEND

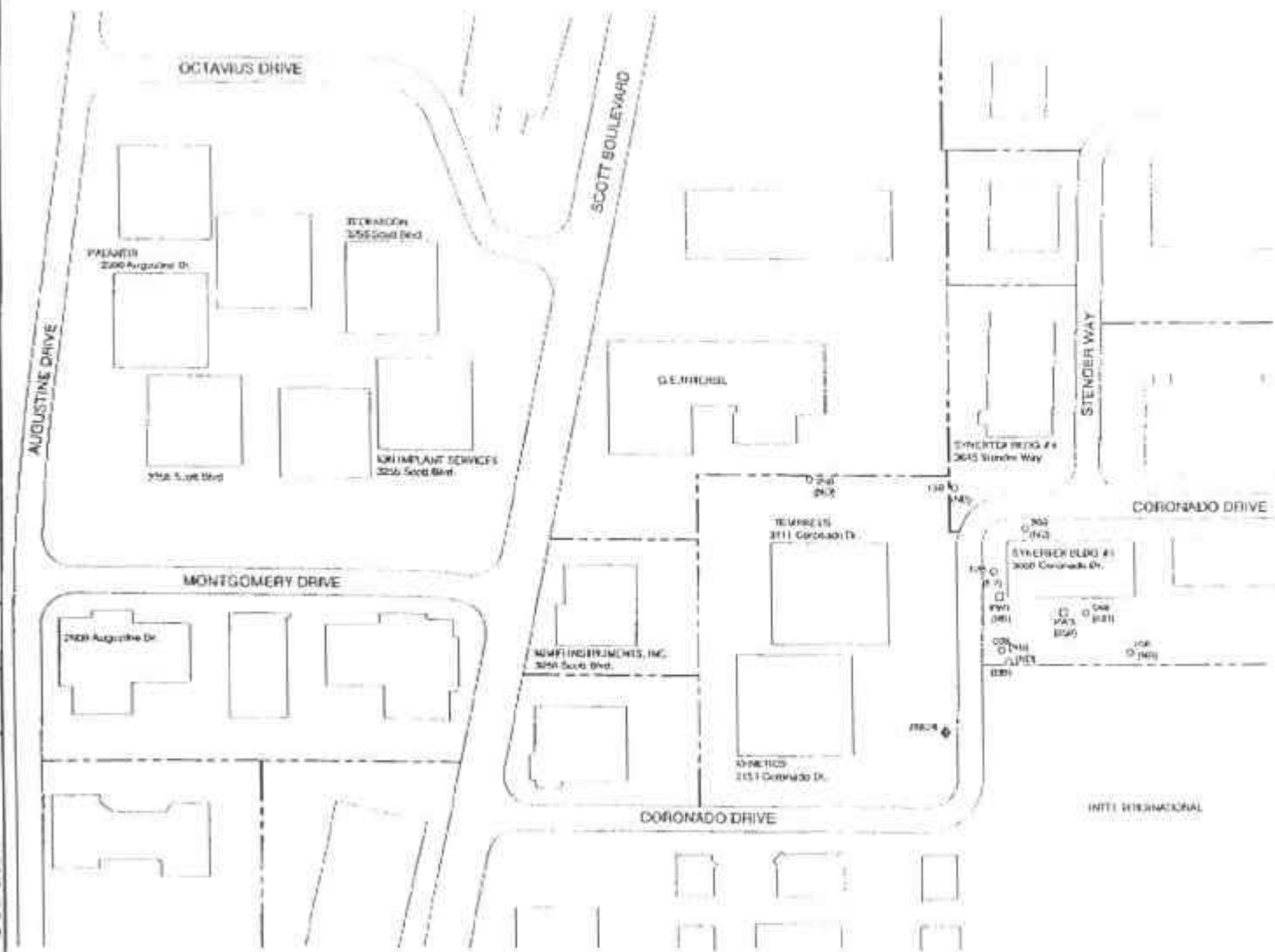
- A QUANTITATIVE MONITORING WELL
- A QUANTITATIVE EXTRACTION WELL
- FORMER AGRICULTURAL WELL
- INJECTION WELL
- CONCENTRATION (GWT)
- (ND) NOT DETECTED

0 FEET 200 SCALE



HONEYWELL INC.
SMARTEX BUILDING #1
3050 CORONADO DRIVE
SANTA CLARA, CALIFORNIA

FIGURE 10
TOTAL TARGET VOCs
AQUIFER (2003)



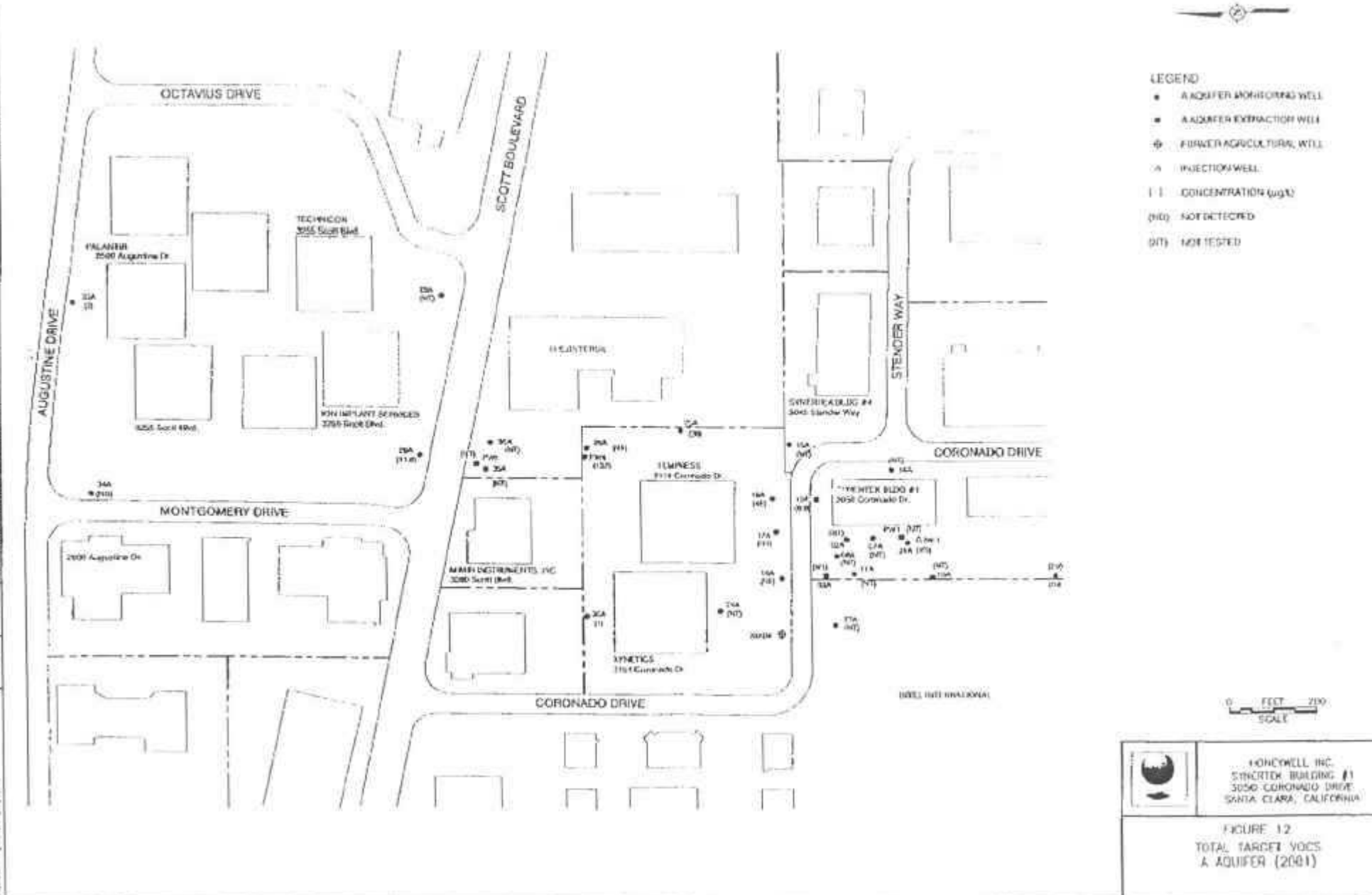
LEGEND

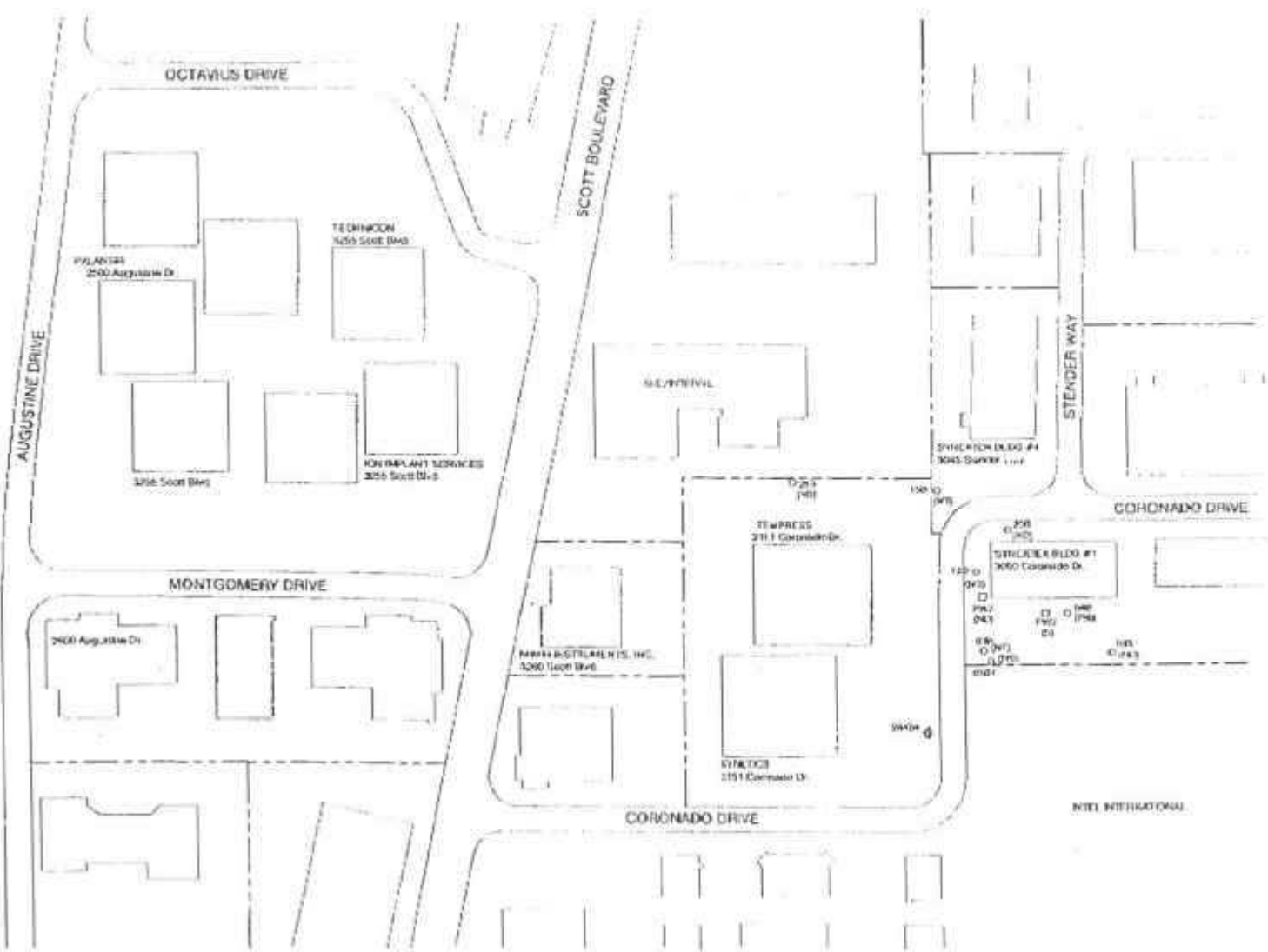
- | | |
|---|-----------------------------|
| 0 | 1) AQUIFER MONITORING WELL |
| 1 | 2) AQUIFER EXTRACTION WELL |
| 2 | 3) OPENED AGRICULTURAL WELL |
| 3 | 4) INJECTION WELL |
| 4 | 5) CONCENTRATION (mg/L) |
| 5 | 6) NOT DETECTED |



HONEYWELL INC.
SYNTECH BUILDING #1
3050 CORONADO DRIVE
SANTA CLARA, CALIFORNIA

FIGURE 11
TOTAL TARGET VOC'S
IN AQUIFER (2000)





LEGEND

- @ AQUIFER MONITORING WELL
 (E) AQUIFER EXTRACTION WELL
 @ OTHER AGRICULTURAL WELL
 @ INJECTION WELL
 () CONCENTRATION ($\mu\text{g/L}$)
 (ND) NOT DETECTED
 (NT) NOT TESTED



HONEYWELL INC.
SYNORTEK BUILDING #1
3000 CORONADO DRIVE
SANTA CLARA, CALIFORNIA

FIGURE 13
TOTAL TARGET VOCs
B-AQUIFER (2001)

Upgradient Well 1A

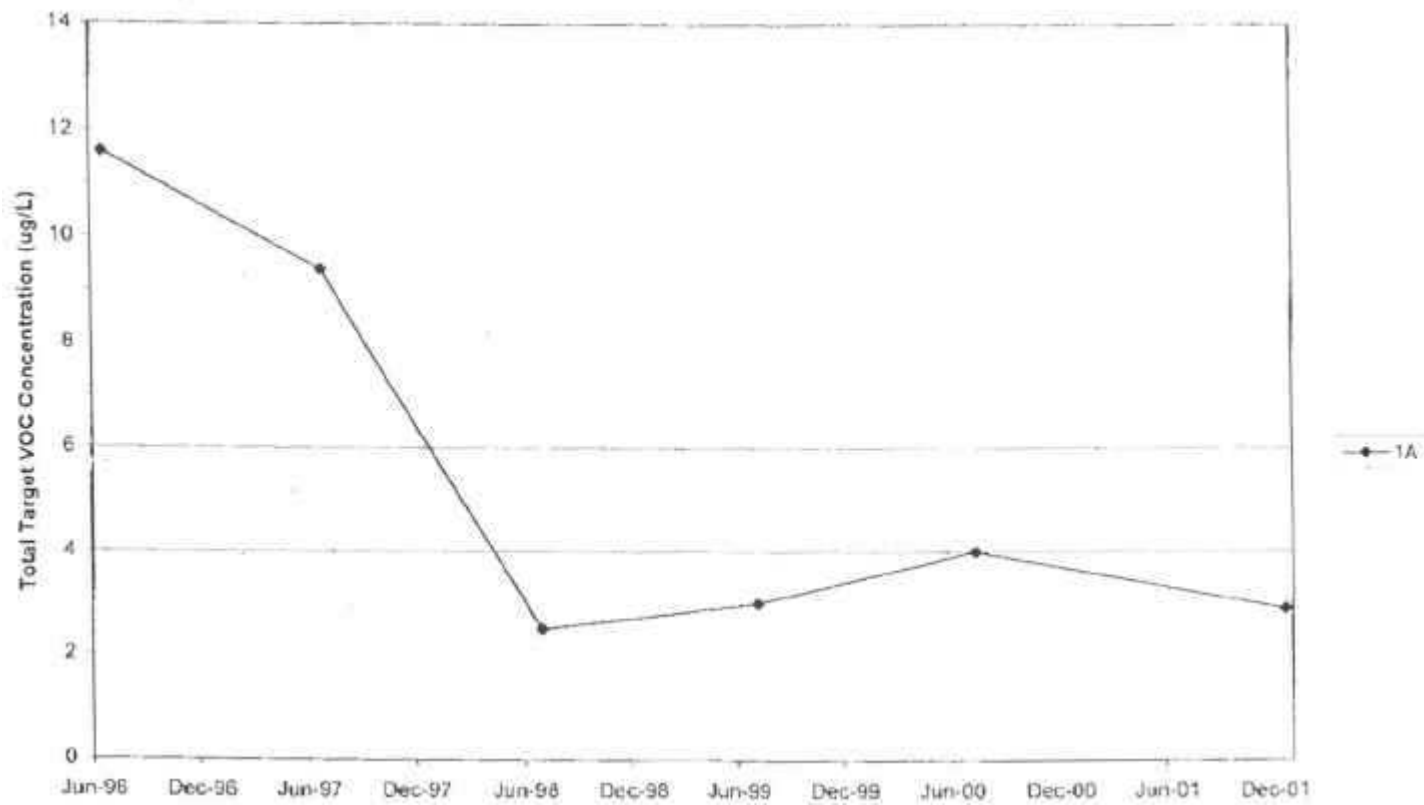


Figure 14

Within Plume

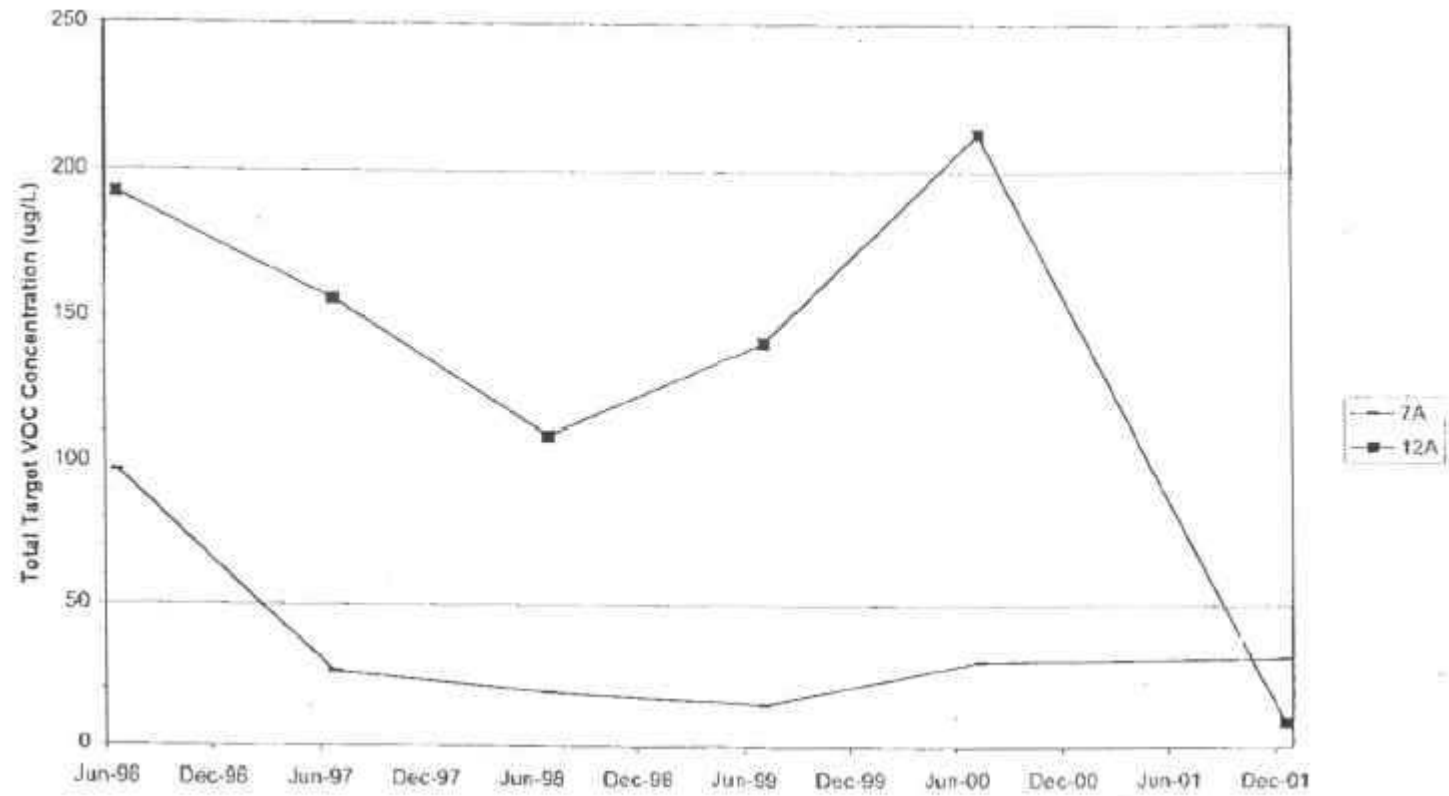


Figure 15

Downgradient (Near)

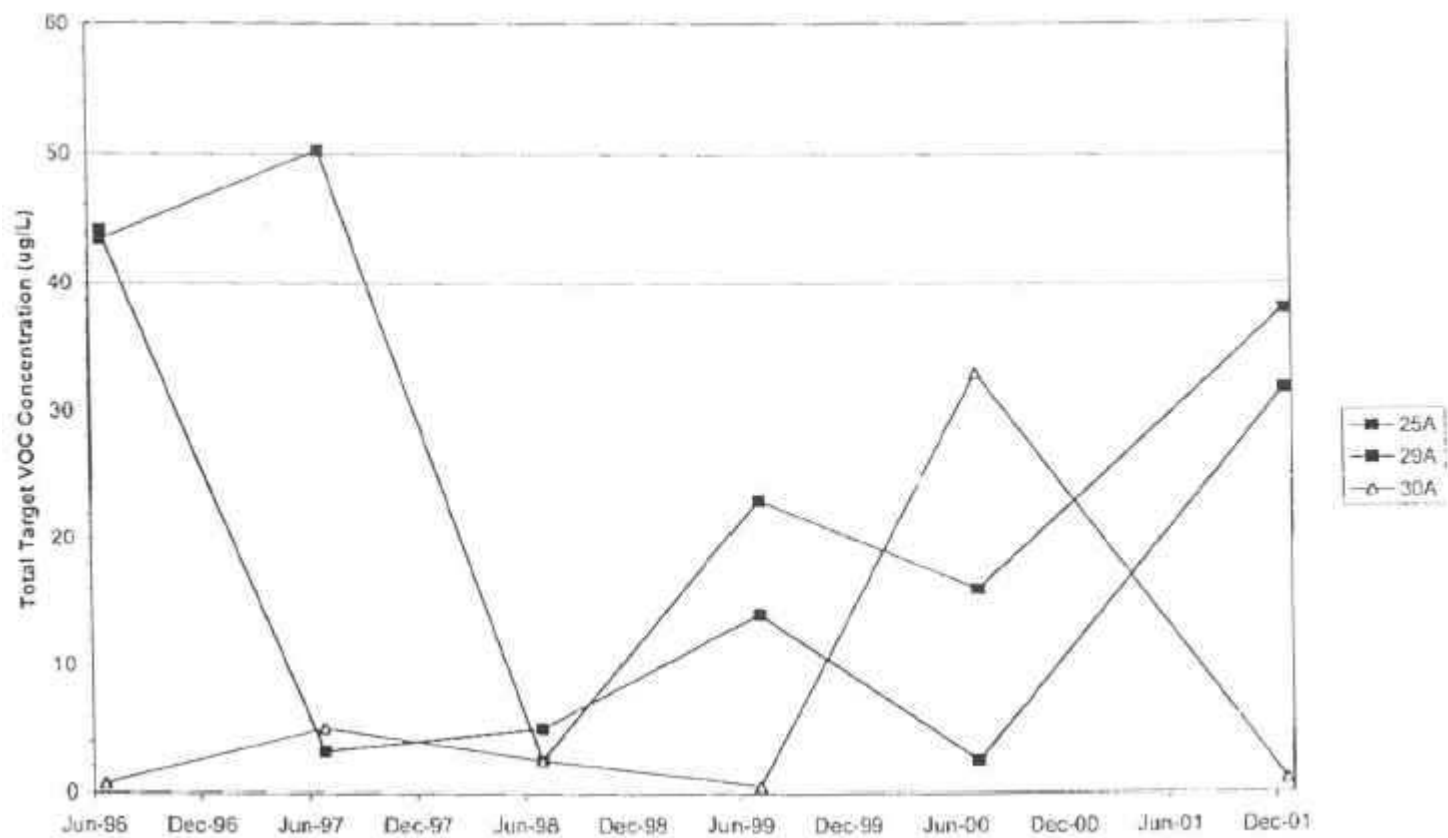


Figure 16

Downgradient (Far)

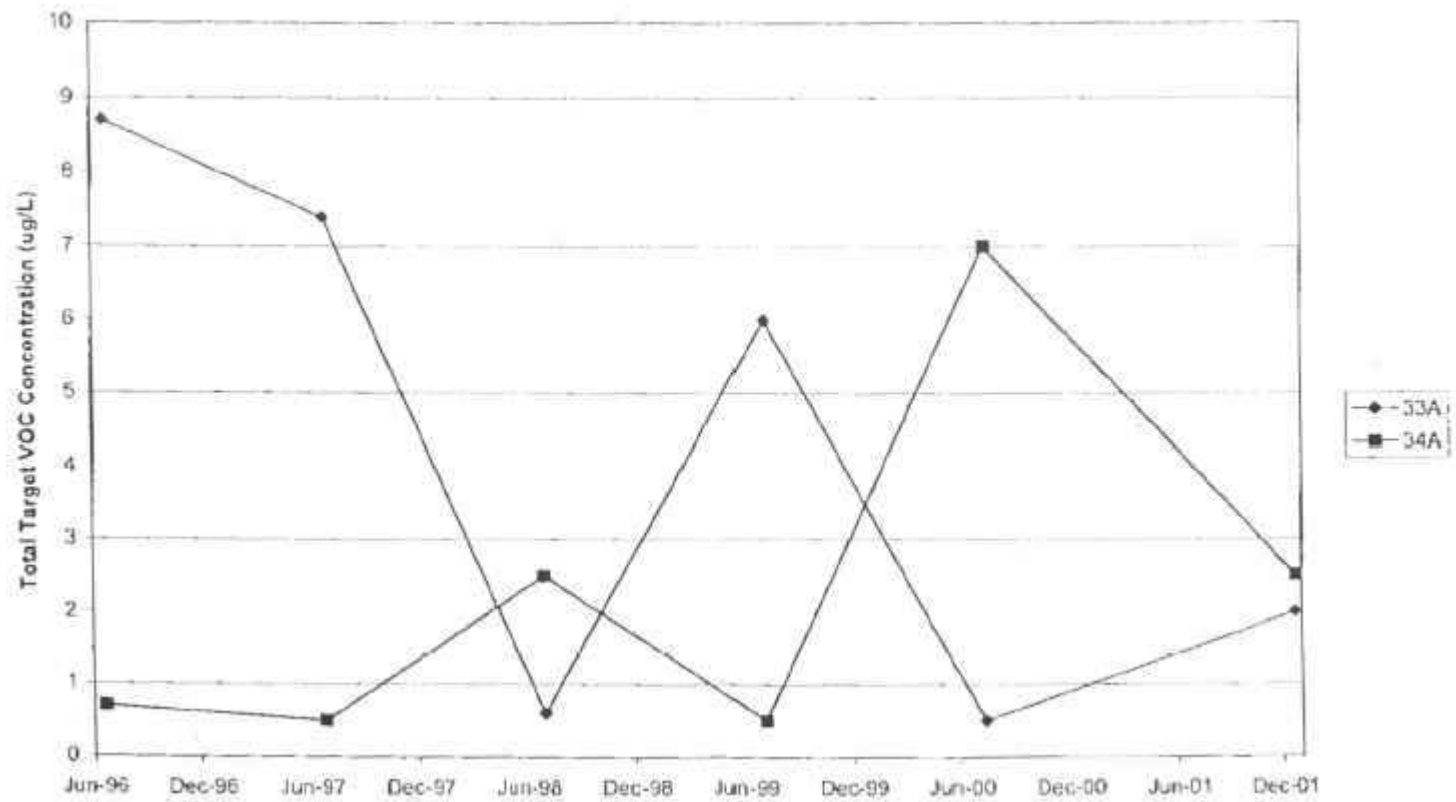


Figure 17

Aquifer B - Well 4B

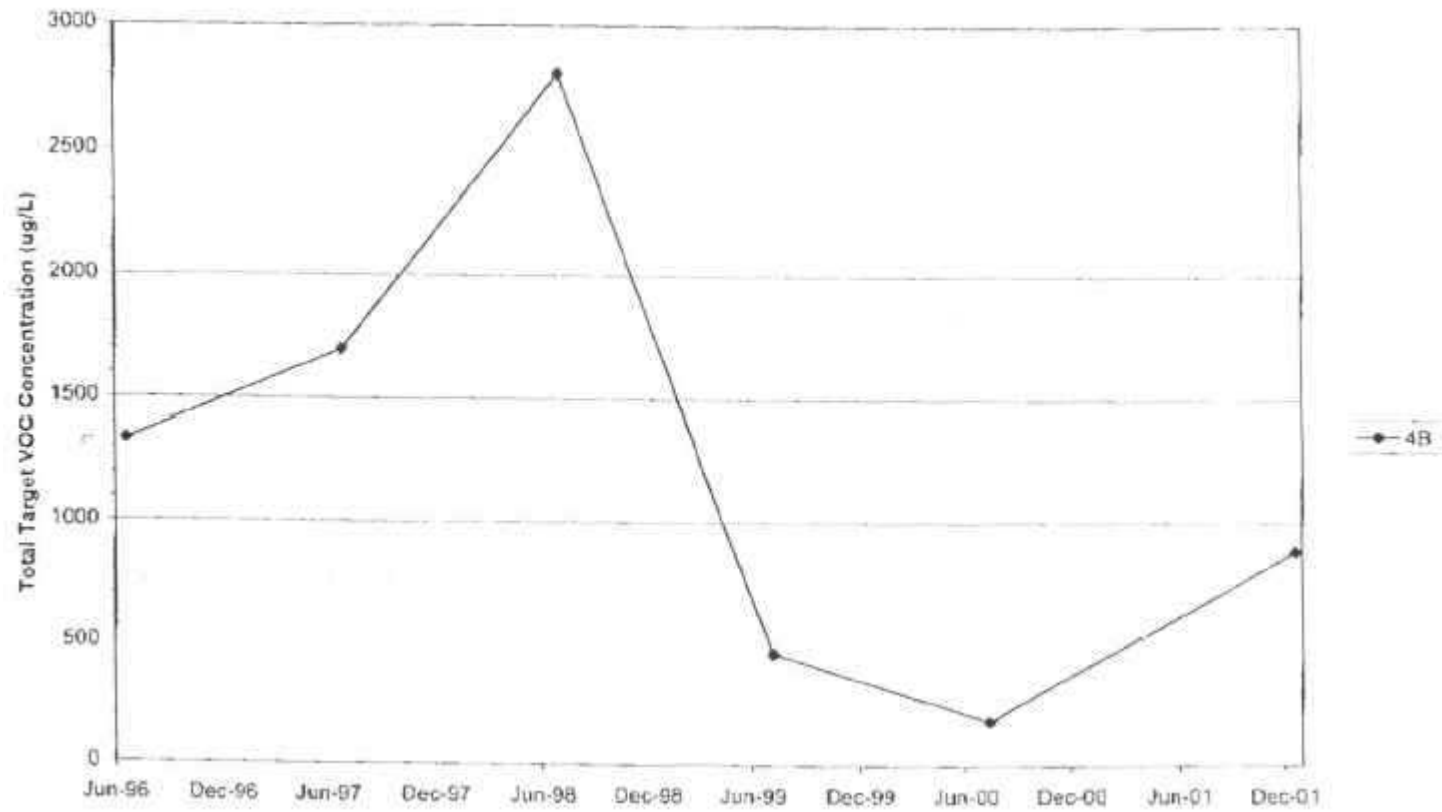


Figure 18

Aquifer B - Well 12B

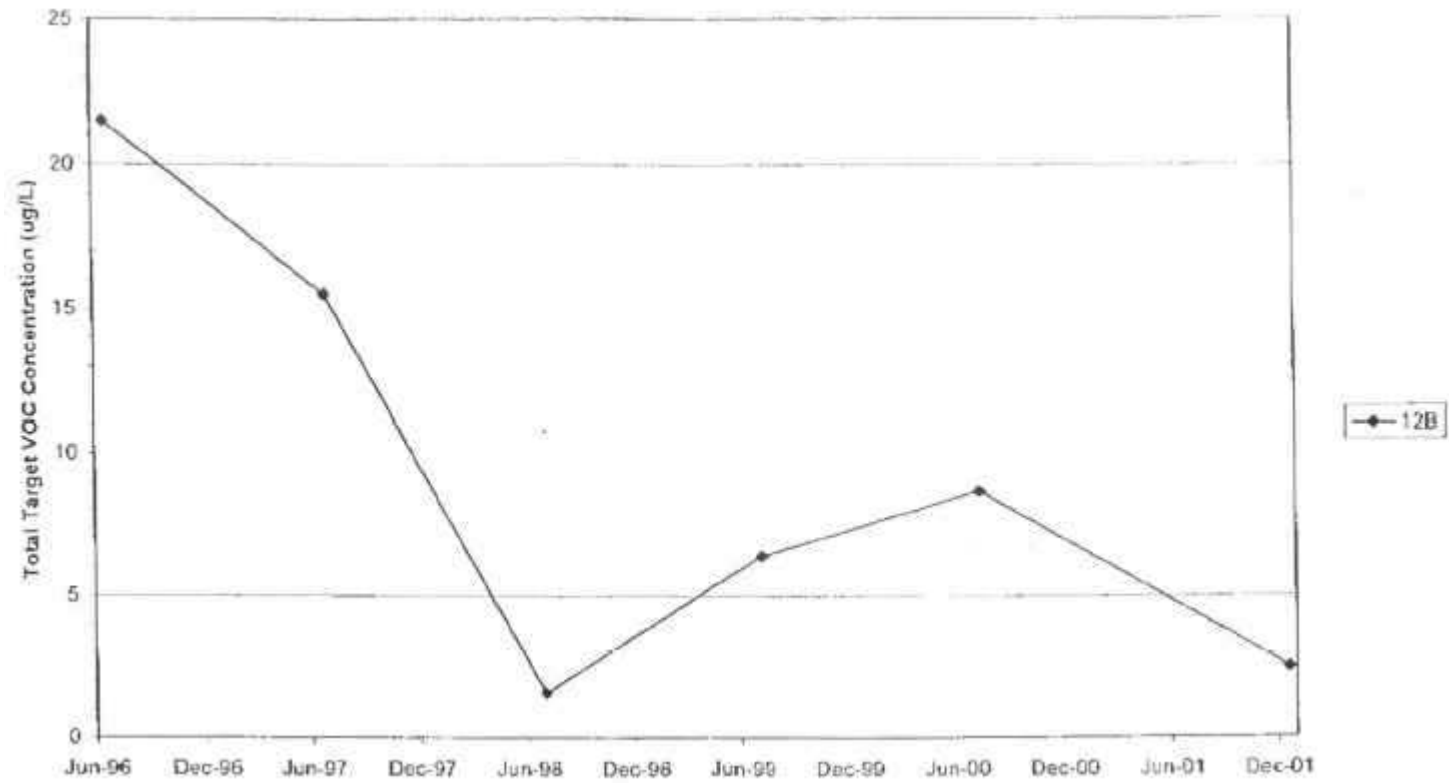


Figure 19